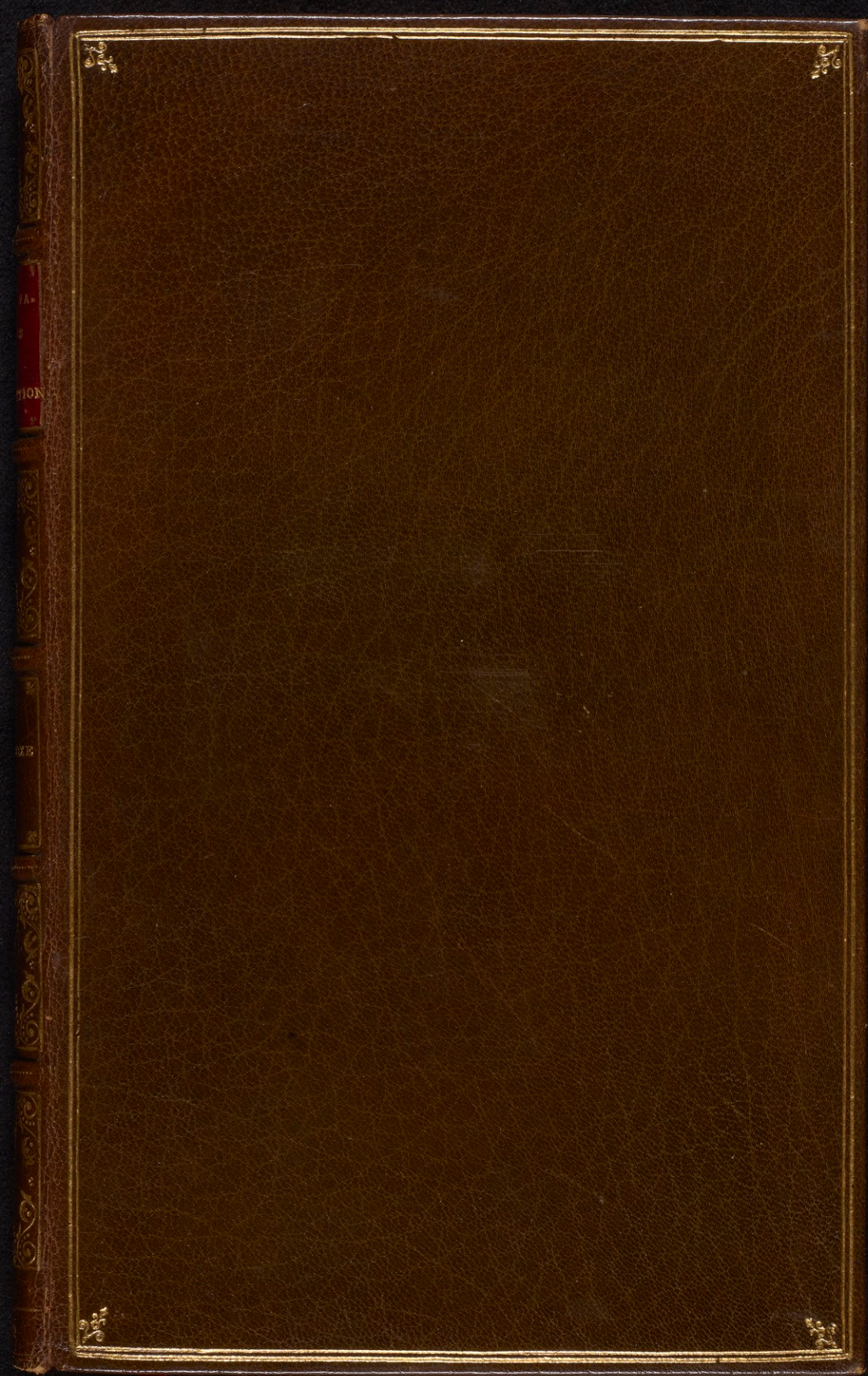
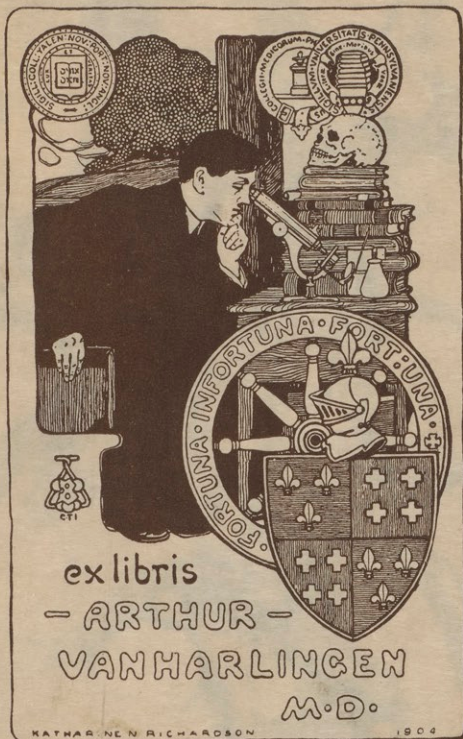






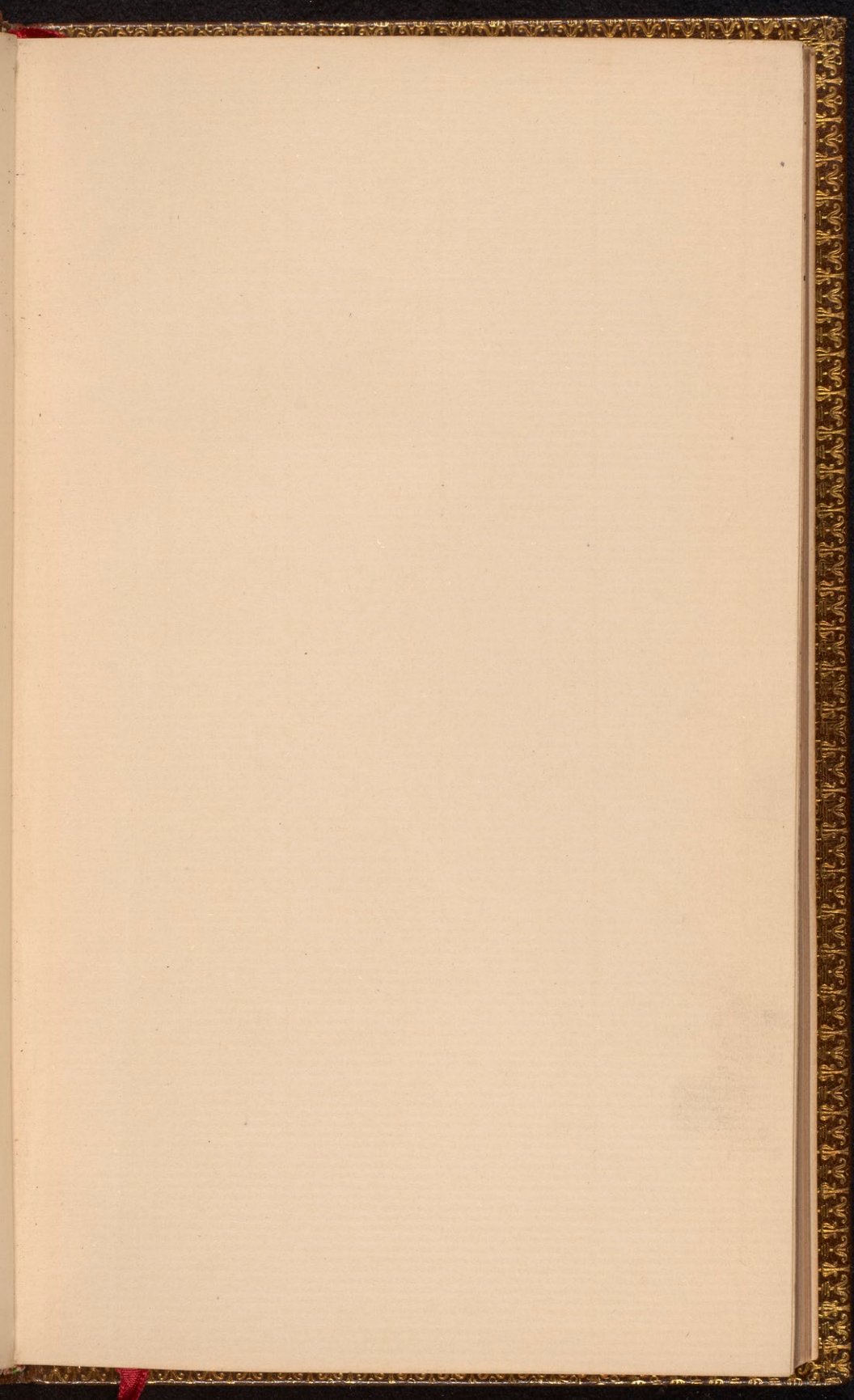
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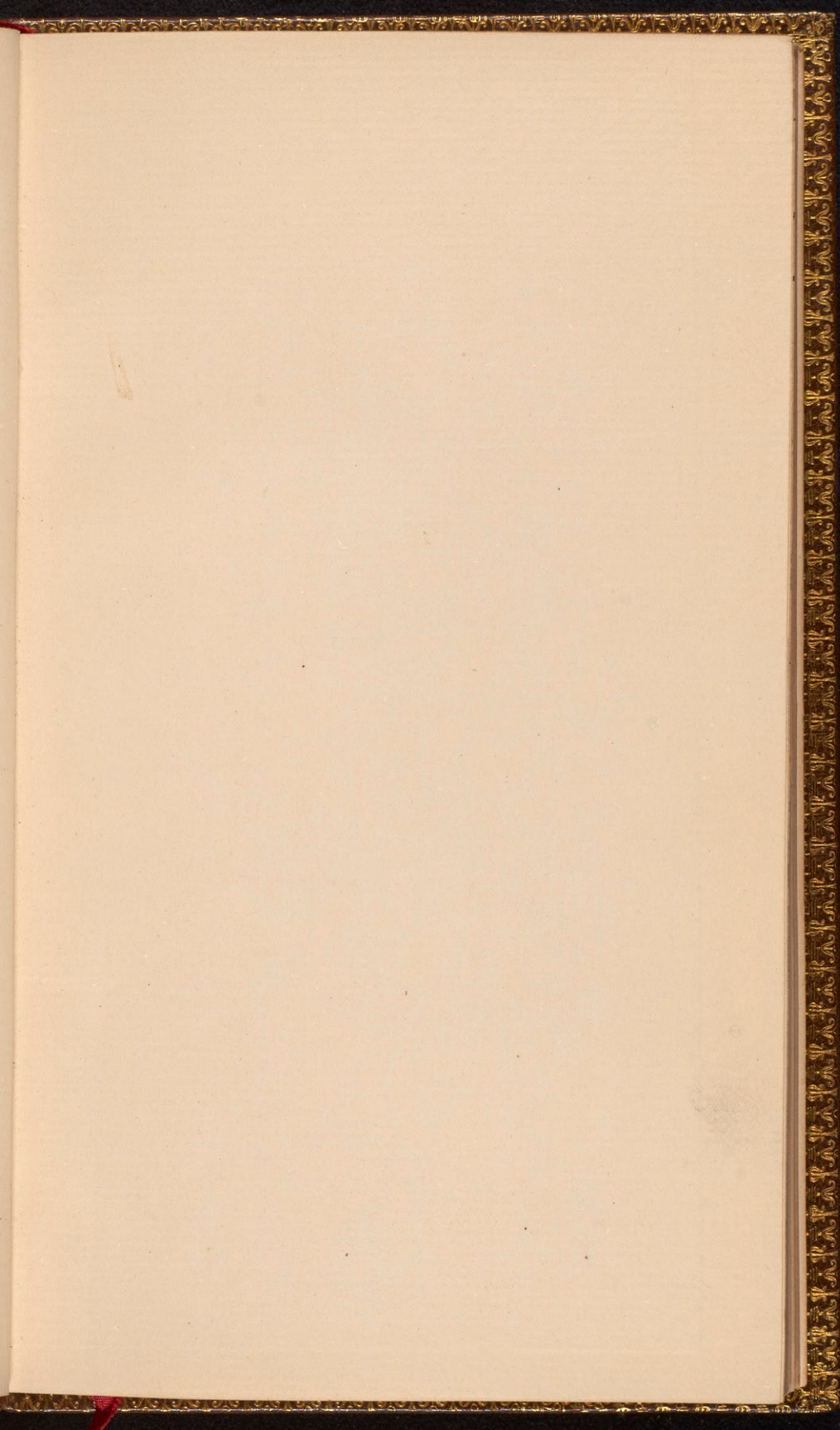
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Profile

Vaccine

Small Pox

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7. dot.

Tanner

E. B. Hockton - 1816

presented by the Author

PRACTICAL OBSERVATIONS

A. Van Harlingen, from

ON

Cousin Dr. Lewis Foxe.

Phila., Oct 30, 1865.

Vaccination:

OR

INOCULATION

FOR THE

COW-POCK.

BY JOHN REDMAN COXE, M. D.

MEMBER OF THE AMERICAN PHILOSOPHICAL SOCIETY, AND ONE
OF THE PHYSICIANS TO THE PENNSYLVANIA HOSPITAL.

Embellished with

A COLOURED ENGRAVING,

Representing a comparative View of the various Stages of the
VACCINE and SMALL-POX.

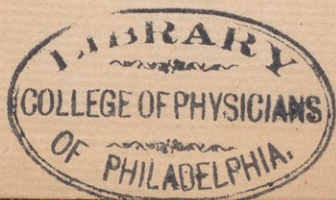
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Dear Sir

My Son informs me of your intention to sail for the Island of St. Jago de Cuba, for the improvement of your health, which, I sincerely trust will thereby be fully re-established, and you be enabled to return soon to your family & friends -

I hope the enclosed letter to Dr Wilson of St. Jago will meet him safely there. I saw with regret, that he sailed from hence but a few days past, without my having had any previous knowledge of his being in Philadelphia, as it would have afforded me the opportunity of making you personally acquainted with him, and possibly would have induced you to an earlier voyage, under his immediate medical direction -

Believe me Sir, with much respect,
Yr very obed^t. Serv^t.

John Redman Foxe

Philad^a Jan^y 7. 2d 1841.

Mr. Van Hartingen.

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TO

EDWARD JENNER, M. D. &c.

SIR,

THAT Philanthropy, which has already so deservedly exalted you in the opinion of the world, will I trust plead my excuse, in thus obtruding on your important avocations, the result of my observations respecting the invaluable blessing, you have so widely extended.

The subject is comparatively new amongst us; but its utility, is I hope, firmly established. That you may long enjoy the pleasing reflections of an approving conscience, and the gratitude of the human race, is the sincere wish of,

Sir,

Your Friend,

and Humble Servant,

JOHN REDMAN COXE.

PHILADELPHIA,
June 1st, 1802.

A work on this subject will not, I trust, be deemed either uninteresting or useless to the Practitioners of America, many of whom from their distant situations, cannot so readily acquire information on this new and valuable addition to Medical Science.* When we reflect that the lives of thousands, are perhaps dependent on the speedy extension of this invaluable blessing, I hope I shall be exempted from any charge, but that of a desire to awaken the minds of parents and physicians, to the superiority of this disease over the small-pox.

Having fortunately been instrumental, in introducing this disease into Philadelphia and the adjoining country, I candidly confess, I feel a pleasure in the reflection which nothing should tempt me to forego; Nor are my feelings less agreeable, in considering myself as the very first person in this city, who actually had it by inoculation here. I have proved in my own person the mildness of the Vaccine, and the perfect confidence I placed in the accounts of its immortal discoverer.

It is proper here to observe, that the prophylactic power of the Vaccine had been long known. This is not the discovery to which Dr. JENNER lays claim.

* One of the principal reasons which influenced the publication of the present treatise, arose from the numerous applications for information on the subject, which it was impossible to comply with in every instance. I request those gentlemen, whom I have thus apparently neglected, to pardon me, as my silence was altogether accidental.

He first experimentally proved, that the virus did not lose its specific property, by being transferred from one human subject to another by inoculation; and to him therefore is mankind indebted for the happy prospect it unfolds, of completely annihilating a disease, whose name alone must ever be remembered with horror.

It is not among the least remarkable circumstances of this discovery, that the fact of its preservative effect against the small-pox should have been so long known, without any practical use being made of it! Like Columbus' egg, the induction now appears so simple, that we are lost in astonishment, it was not sooner verified! It was reserved for the illustrious JENNER; and evinces the truly philosophic mind that readily combines important truths, which others overlook.—This truly important experiment, was made on the 14th day of May 1796: a day ever memorable in the records of humanity, by opening to view a perfect security against the most ferocious and destructive disease, which was suffered to escape from the box of Pandora!

When the important advantages of Vaccination over Inoculation,* are generally known and properly estimated, we may safely conclude the celebrated

* I use the term Vaccination, in opposition to Inoculation, which certainly should now be appropriated solely to the Small-pox. Independently of the propriety of the measure, it prevents the unnecessary addition of the name of the disease employed.

author of the discovery will receive that universal homage he so richly deserves. The philanthropy he has evinced, in communicating it immediately to the public, in place of converting it to his own private emolument,* is worthy of the liberal profession, to which he is so bright an ornament; and, whilst it raises him in the estimation of a grateful world, must certainly prove the strongest reproach to those, who by an opposite conduct, hope to serve themselves at the expence of suffering humanity.

Although I have met with a large proportion of the facts laid down by writers on this disease, and have never neglected for a single day to note every occurrence to which I had previously been a stranger; yet I am very far from viewing the present performance, as giving that complete view of every variety in the disease, which is only to be known by time and longer experience. Enough is said however, I trust, to point out the necessity of strict attention, in order to prevent our being imposed upon by the *spurious* for the *genuine* disease; an error, which by the false confidence impressed, has unfortunately been productive of consequences fatal to the patient, and of injury to the extension of this most valuable blessing. That this is not a false dread, must be very evident to the inhabitants of such places, into which the spurious

* This truly deserving character, has, I have good grounds to assert, spent upwards of £.6000 sterling, or full 25,000 dollars, in his various researches and experiments, relative to this disease.

disease has been unfortunately communicated; even here, where the knowledge of the disease has been more extended, and more easily acquired, it has been insufficient to prevent the occasional appearance of this insidious enemy, which has not failed to check the favourable impression of the disease, which many had previously entertained. To guard in some measure against this evil, I have added an engraving representing the various stages of this disease, which will give Practitioners a pretty good idea of its true character, until experience shall have more fully made them acquainted with it: It is taken from one of Dr. JENNER's, which is excelled only by Nature herself. To this I have taken the liberty to add the *profile* of the pustule on the respective days, as given by Messrs. Ballhorn and Stromeyer, and which I consider an interesting and useful addition, by exhibiting more clearly a striking difference in the Vaccine and Small-pox. To those who are in possession of Dr. JENNER's invaluable engraving, it will appear, that I have in the view of the disease on the *twelfth* day, given that beautiful variety of the recession of the Areola, which is represented in the third plate of his treatise on the "*Variolæ Vaccinæ*," and also in the treatise of Messrs. Ballhorn and Stromeyer; in place of the more usual appearance, which is represented in the plate from which this is copied.

PRACTICAL OBSERVATIONS, &c.

BEFORE we enter upon the consideration of this highly important disease, it may not be improper to take a view of its origin; which I shall be pardoned for presenting to the reader, in the words of Dr. Jenner himself. (See his Enquiry, &c. p. 2 to 6.)

“ There is a disease, to which the horse, from his state of domestication, is frequently subject. The farriers have termed it the *Grease*. It is an inflammation and swelling in the heel, accompanied at its commencement with small cracks or fissures, from which issues a limpid fluid, possessing properties of a very peculiar kind. This fluid seems capable of generating a disease in the human body (after it has undergone the modification I shall presently speak of) which bears so strong a resemblance to the small-pox, that I think it highly probable it may be the source of that disease.*

“ In this dairy-country a great number of cows are kept, and the office of milking is performed indiscriminately by men and maid-servants. One of the former having been appointed to apply dressings to the heels of a horse affected with the malady I have mentioned, and not paying due attention to cleanliness, incautiously bears his part in milking the cows, with some particles of the infectious matter

* This Treatise it must be remembered, was written in 1798.

adhering to his fingers. When this is the case, it frequently happens, that a disease is communicated to the cows, and from the cows to the dairy-maids, which spreads through the farm until most of the cattle and domestics feel its unpleasant consequences. This disease has obtained the name of *Cow-pox*. It appears on the nipples of the cows in the form of irregular pustules. At their first appearance they are commonly of a palish blue, or rather of a colour somewhat approaching to livid, and are surrounded by an inflammation. These pustules, unless a timely remedy be applied, frequently degenerate into phagedenic ulcers, which prove extremely troublesome. The animals become indisposed, and the secretion of milk is much lessened. Inflamed spots now begin to appear on different parts of the hands of the domestics employed in milking, and sometimes on the wrists, which run on to suppuration, first assuming the appearance of the small vesications produced by a burn. Most commonly they appear about the joints of the fingers, and at their extremities; but whatever parts are affected, if the situation will admit, these superficial suppurations put on a circular form, with their edges more elevated than their centre, and of a colour distinctly approaching to blue. Absorption takes place, and tumours appear in each axilla. The system becomes affected, the pulse is quickened; shiverings, succeeded by heat, general lassitude, and pains about the loins and limbs, with vomiting, come on. The head is painful, and the patient is now and then even affected with delirium.* These symptoms, varying in their degrees of violence, generally continue from one day to three or four, leaving ulcerated sores about the hands, which, from the sensibility of the parts, are very troublesome, and commonly heal slowly, frequently becoming phagedenic, like those from whence they sprung. During the progress

* "It will appear in the sequel that these symptoms arise principally from the irritation of the sores, and not from the primary action of the Vaccine virus upon the constitution." *Note of Dr. J.*

of the disease, the lips, nostrils, eye-lids, and other parts of the body, are sometimes affected with sores; but these evidently arise from their being heedlessly rubbed or scratched with the patients' infected fingers. No eruptions on the skin have followed the decline of the feverish symptoms in any instance that has come under my inspection, one only excepted, and in this case a very few appeared on the arms; they were very minute, of a vivid red colour, and soon died away without advancing to maturation; so that I cannot determine whether they had any connection with the preceding symptoms.

"Thus the disease makes its progress from the horse (as I conceive) to the nipple of the cow, and from the cow to the human subject."

It was for a considerable time supposed, that this idea of the origin of the extraordinary disease in question was ill founded, because several attempts had ineffectually been made to excite the disease in the cow, by immediate inoculation with the matter of grease;* but it would seem from more fortunate experiments, that its real origin is here developed. In Ring's Treatise, p. 14, &c. a veterinary surgeon is said to have actually succeeded in "producing the disease artificially in a cow, by removing a scab from the teat, and applying the recent blackish matter of grease to the absorbing surface of the sore."

* This idea is opposed by the justly celebrated Dr. Woodville, whose experiments to elucidate this interesting point, entitle him to the greatest praise.—A knowledge however of the success of the experiment in other hands, which so often proved abortive with Dr. W. may be of service in guarding against the mode of drawing *general* conclusions, from *negative* experiments. We here see, all reasoning drawn from them, however plausible, at once falls to the ground by this *single positive* fact. In the same hasty manner, conclusions have been drawn, that persons who have previously had the Small-pox, are exempt from the Vaccine; which although it may be

Mr. Ring at page 15, has given a very interesting letter from a Mr. Rankin, relating a case of disease accidentally produced on the face and hands of a farmer, by the fluid oozing from the heels of a horse labouring under the scratches, which spirted upon him when dressing him. The pustules induced, bore the *strongest resemblance* to the casual Cow-pox, and were attended with considerable fever, full quick pulse, violent head-ach, foul tongue, thirst, &c.

At page 693, Mr. Ring says, "I am informed by Dr. Jenner, that in the case where the Cow-pox could be traced by Mr. H. J. Jenner from the grease, a boy, having drawn a string backwards and forwards over the heels of the horse, drew it repeatedly across his fingers, till he had caused an abrasion of the cuticle. Thus the subjacent parts were inoculated with the virus of the horse; and the disease *resembled* the Cow-pox; the lymphatics exhibiting beautiful tints of red, in consequence of that affection."

Dr. Jenner has favored us with a remarkable case which came under his notice, of the system remaining unsusceptible of the variolous contagion, after having been affected by the matter issuing from the heels of horses. The indisposition produced had been pretty severe. *Six* years afterwards, the Doctor inoculated the person repeatedly, and exposed him also to the contagion of the small-pox, but without producing any effect. To this case is annexed a note, stating as a remarkable fact well known to many, the frequent failure of attempts to communicate the small-pox by inoculation to blacksmiths, who in the country are far-

generally the case, is not so in every instance, as I shall hereafter notice; hence *patience* is a great desideratum in experimenting.—Cows undoubtedly, as well as men, are not always in a state to receive the impression of this disease:—Hence the frequent failure by inoculation in one person with the very same matter, and with similar precautions, which produces it in others,

riers; and asking if it may not now be accounted for, on rational principles.*

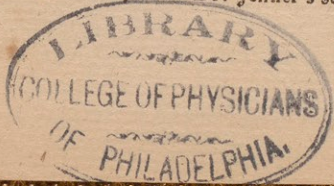
Another instance is adduced by Dr. Jenner to prove the obscure appearance of small-pox, after the disease produced by the grease, at least occasionally. In the next case however he attempts to shew, that this cannot be *entirely* relied on, "until a disease has been generated by the morbid matter from the horse on the nipple of the cow, and passed through that medium to the human subject;"—for the person who is the subject of this case, took the small-pox upwards of twenty years afterwards. (See cases 13, 14, 15.)

Though these cases do not completely prove the Vaccine to originate from the Grease; yet the two first must be allowed to render the idea extremely probable.

Three men were affected from the heels of a mare with sores in their hands, followed by inflamed lymphatic glands in the arms and axillæ, shivering succeeded by heat, lassitude, and general pains in the limbs. Two of them had passed through the small-pox, and described their feelings as very similar in both diseases. One of these was daily employed as a milker at the farm; and in about ten days after washing the mares' heels, the disease began to appear among the cows. This fact certainly goes far in demonstrating the origin of the disease; and the probability is increased by the subsequent information, that "a child of five years old was inoculated with matter taken from a pustule on the hand of one of these men: He became ill on the sixth day with *symptoms similar to those excited by Cow-pox matter.*" Dr. Jenner was prevented ascertaining, whether the matter thus passing from the horse through the human constitution, will produce a similar effect, as after passing through the cow, in consequence of this child dying before any trial was made with variolous matter. §

* It would be satisfactory to have this fact further established by those medical gentlemen, whose situation in the country gives them greater opportunities of attending to it.

§ This child's arm is the subject of Dr. Jenner's second plate.



It appears to me, the foregoing facts are sufficient in the mind of an unbiassed person, to establish the truth of Dr. Jenner's important opinion of the origin of this disease. If more are deemed necessary, they may be found in Dr. Jenner's invaluable treatise, to which I must refer, particularly to his interesting observations at p. 90 & *seq.**

Before I conclude this part of the subject it may not be amiss to mention Dr. Jenner's opinion, of the probability that other parts of the horse as well as the heels, are capable of generating the virus which produces the Cow-pox.

"An extensive inflammation of the erysipelatous kind appeared without any apparent cause upon the upper part of the thigh of a sucking colt, the property of Mr. Millet, a farmer at Rockhampton, a village near Berkeley. The inflammation continued several weeks, and at length terminated in the formation of three or four small abscesses. The inflamed parts were fomented, and dressings were applied by *some of the same persons* who were employed in milking the cows. The number of cows milked was twenty-four, and the *whole of them* had the Cow-pox. The milkers, consisting of the farmer's wife, a man and a maid-servant, were infected by the cows. The man-servant had previously gone through the Small-pox, and felt but little of the Cow-pox. The servant maid had some years before been infected with the Cow-pox, and she *also felt it now* in a slight degree. But the farmer's wife, who never had gone through either of these diseases, felt its effects very severely." See p. 62.

As it is of great importance to determine with precision, the origin of this disease, I have been more full, than otherwise to many might seem necessary; but as this question involves in it the possibility of producing the disease amongst us, whenever we unfortunately may lose the infection, I

* I shall in a future part give some interesting communications respecting the domestic origin of the disease among our own cows.

have stated what will I think suffice to call the attention of those persons to it, whose time and opportunities may enable them to do justice to the subject.*

As I entertain but little doubt from what is above stated, that the origin of this disease has been satisfactorily traced by the illustrious Jenner, I may be permitted to add, that amidst our veneration for the cow, we should not forget our grateful tribute to the horse, for doubly proving, thus, a source of health and pleasure. Experiments must determine, whether the teat and udder of the cow by inoculation with the grease, are alone capable of elaborating this infection; or whether other animals may not be employed so to modify it, that it may serve the same good purpose. It is an important fact deserving of notice, by those who may be disposed to pursue experiments on the subject of this disease, that when it broke out among the cows of Grey's inn lane, (Woodville, p. 10.) of two hundred cows, four-fifths were eventually infected; the rest, which *were not in milk*, escaped the disease. This proves its non-contagious nature; but the object I have in view in mentioning it, is to ascertain if the cow in this state, is less liable to receive the infection by inoculation; for having vaccinated a cow in this situation *twice*, ineffectually, by five punctures in all, and with *fresh* matter, I am rather suspicious it may be the case.

Having never seen the *casual* Cow-pox as it has been termed, that is, the disease communicated immediately from the cow to the human subject, I shall refer to Dr. Jenner's account, observing only, that it is to be viewed in the light

* Great accuracy is requisite in conducting such experiments, that we may know every circumstance tending to render them successful, when it is necessary to recur to them for a supply of infection. They must chiefly be made in the country, from the greater facility of procuring the matter of grease, &c. than in town.

of an inoculated disease, although not effected with the point of a lancet, nor even perhaps through the medium of an abraded cuticle, though probably this is the case in most instances. It is said to be generally a more violent disease, which may partly arise from the greater number and magnitude of the pustules, than when communicated by art, in consequence of the greater extent of surface exposed to the infection in milking the cow.

In order that it may be understood what day precisely of the disease is spoken of in the following pages, I must remark, that the *first* day commences from the moment of the insertion of the virus, and is completed at the same hour of the succeeding day; so that, when mention is made of any particular day, as the sixth, it is to be understood of the whole twenty-four hours, immediately following the completion of the fifth day. It may be thought unnecessary to mention this; but some persons I believe, are not in the habit of counting the day of inoculation as the first, which becomes a source of error and confusion, from a want of uniformity in a circumstance apparently trifling.

This disease as communicated by inoculation, in its commencement much resembles the small-pox: Towards the middle or close of the second day when the operation takes effect, (that is thirty-six to forty-eight hours from the period of inserting the virus), a light speck of inflammation may generally be perceived: This becomes much more conspicuous in the course of the third day, and in most instances by the commencement of the fourth, a minute pimple may be felt rising above the skin, and surrounded by a circular inflammation at its base. It now gradually increases in size, and by the close of the fifth day begins to assume, (especially if viewed with a magnifying glass), that appearance which so much distinguishes it from the small-pox. This consists in the perfect regularity, and beautifully circumscribed form of the pock, which has a surface flattened, with a depressed

centre, of a darker colour,* so as to give an appearance of elevated edges. In the small-pox on the contrary, by the sixth day, the inoculated part begins to assume an irregular, or angulated appearance, and its surface is not so flattened in proportion to its diameter. This circumscribed appearance is retained by the Vaccine during its whole progress, even during the process of scabbing, whilst the small-pox becomes daily more irregular, in consequence of the confluence of the adjoining pustules. (See the plate.)†

About the fifth day, the pock begins to change from the red pimple to a vesicle containing a fluid, which through the cuticle somewhat resembles the colour of whey. This fluid is at its first formation in its most active state, and probably will be less liable to fail, if taken at this early period, than if delayed to a later day. From the sixth day to the tenth is mentioned as the proper period for collecting it; I shall however notice some exceptions to this hereafter. During this interval the pock augments considerably; the flattened appearance becoming more conspicuous in proportion to its size; so that sometimes in a pock of nearly half an inch diameter, its elevation above the surrounding skin will scarcely, if at all, exceed the one tenth, or the one twelfth of an inch, evincing at the same time, the total absence of the plump rotundity of the variolous pustule. About the eighth or ninth day, the pock having arrived to maturity, the constitutional symptoms begin to shew themselves; the general indis-

* This dark coloured speck in the centre, Mr. Addington says, "represents the cuticle still adhering in that spot to the skin underneath." p. 16.

† It is this peculiar appearance of the Vaccine disease, which is to be particularly attended to, in forming our opinion of its genuine character. The more it recedes from this standard, the greater is the probability of its being a spurious disease which is excited. It may be proper to observe, when the Vaccination is performed with an infected thread, the subsequent pustule is sometimes of an oblong or oval figure, though still retaining its regular circumscribed form.

position being preceded by swelling and pain of the pustule shooting up towards the axilla, (and shoulder occasionally), the glands of which now become swelled and painful, especially on moving the arm, whilst the system sympathises, as evinced by languor, drowsiness, paleness, chilliness, and flushes of heat, head-ach, pain and fulness of the eyes, pain of the limbs and of the back, loss of appetite, nausea, and sometimes vomiting, an increased frequency of pulse, thirst, and white tongue. It is not to be supposed that these all occur in every patient; on the contrary, it is difficult in many instances to detect the presence of any one of them; some or other of them however for the most part occur, and continue with greater or less violence, (seldom so as to confine the patient) from one hour, to two, three or more days, when they subside spontaneously, without any disagreeable consequence. The slight marginal inflammation which has accompanied it from its first appearance, about the eighth or ninth day begins to augment very moderately, increasing more rapidly about the tenth or eleventh days, so as to extend to one, two, three, or more inches in diameter, forming a most beautiful efflorescence or areola, which has been regarded as a proof that the general affection of the system had taken place: As however the areola does not always exist, and yet the prophylactic property of the disease is perfect; we must not lay too great a stress upon it, nor be alarmed at its non-appearance, under an idea of the disease being merely local.*

The centre of the pustule which always is depressed, now begins to assume a darker appearance; this gradually

* That the areola, even though it does occur, is not to be considered as an absolute proof of the existence of the constitutional affection, may be inferred from its presence in a spurious disease, (see case 1) in which not the slightest indisposition existed: Whereas in most instances the constitutional effects are more violent in the spurious disease.

extends to the circumference, and in three, four, or five days, the scab is generally complete, so that by the fourteenth day it is of a brown colour, darkest in the centre, and assuming a polished hue. This dark brown, or mahogany appearance,* daily grows more intense as the fluid beneath is absorbed; at length it begins to detach itself at the circumference from the edge of the surrounding skin, still adhering at the centre beneath, till eventually, it falls off at different periods of time, generally from three to four weeks from Vaccination, leaving the skin sound, but mostly with a slight depression or pit.

About the eleventh day, the areola is mostly at its height, when it exhibits the appearance of a pink, or damask rose, accompanied with tumefaction and hardness of the limb, to the extent which it occupies.|| Its appearance is sometimes alarming to those, who from not having before seen the varieties of the disease are not prepared for such a sudden alteration. It however subsides in a few days, and frequently retires from the centre first; leaving as it were, an interval of uninflamed surface, surrounded by a ring of efflorescence. A light blush however mostly remains till the completion of the scab;§ the tumefaction generally declines with the efflorescence.

This may be considered as a tolerably accurate account of the progress of the disease, as it has occurred to me. Some

* This colour has been more properly compared I think by Mr. Addington to the colour of a dried tamarind stone. I may notice here that in the African, it rather seems to be influenced by the colour of the rete mucosum, as it generally I think approaches to a black. Since writing the above note, I am happy to add the opinion of Dr. Spense of Dumfries (Virginia), who says it precisely resembles "a piece of rough black sealing wax."

|| There is considerable variety in the actual grade of the colour of the areola, from a light pink to a deep crimson.

§ It may be rather said to exhibit a dusky hue, attended with a desquamation of the cuticle to the extent of the tumour produced.

varieties remain to be considered, most of which I have likewise seen, and which I shall treat of in the same order.

The success of the operation must depend in a great degree, upon the disposition of the system to receive the impression of the disease, when we are perfectly assured of the goodness of the infection. I say in a great degree, because even with such a disposition existing, the best matter may fail by an injudicious mode of Vaccination, so as to produce great local irritation, which effectually prevents absorption. This we also find is often the case in the variolous inoculation. In perhaps a majority of cases, the first attempt succeeds. As far as my experiments go, I have excited the disease in about three-fifths by the first attempt, or rather more than one-half. § Whether the cases of failure would have equally opposed the variolous contagion is perhaps impossible to say; I rather apprehend it would have proved to be the case.* Mr. Ring, p. 508, relates the case of the brother of Dr. E. Bancroft, who "was inoculated for the small-pox *eleven* times, and once taken to a patient labouring under the disease, and inoculated in both arms with a large quantity of recent matter, but to no purpose; yet he afterwards caught the small-pox in the natural way." Mr. Ring mentions three instances of *five* attempts, and one of *six*, before infection took place, in his practice, and ascribes it to the constitution of the patient, since it was chiefly in children of a weak habit, that this difficulty occurred.† It is not however probable, that this

§ By a reference to the tables I have drawn out of the first fifty cases which came in order under my care, it will be seen, that many attempts were made with old infection, in order to ascertain how long it might be preserved. I have therefore I believe, failed more frequently than others who have invariably employed recent matter. See the last note of the tables.

* Dr. Rollo mentions a child having been vaccinated ineffectually, who ten days before had also been inoculated for the Small-pox without success. Ring, p. 124.

† See cases 9 and 30 of the tables, far exceeding those mentioned by Mr. Ring.

weakly constitution should alone be the cause, as independently of my having succeeded frequently in the first attempt on weakly children, many of my patients in whom it failed, were by no means to be classed in this description. Although we cannot account for it, the fact remains certain, that one person more readily receives this disease (as well as other diseases), than another; and that this disposition varies in the same person at different times.

The appearance of the speck of inflammation indicating the success of the operation is also very various. In general we may very accurately perceive it about the commencement of the third day. In several cases I have however observed it evidently early on the second day, or between twenty-four and thirty hours from Vaccination. I speak here only of such cases which actually succeed, for sometimes a considerable inflammation takes place in a few hours, with great itching, and even an elevation of the cuticle as if a pustule was commencing. Where this occurs, we may almost invariably, perhaps always, predict the failure of the attempt. This is likewise generally the case in the small-pox, when the system is disposed to reject it. This species of local irritation I have experienced repeatedly, in the attempts I have made to produce the Vaccine a second time in myself; but which have hitherto failed; the inflammation disappearing about the fourth day.*

It sometimes happens that the disease instead of becoming perceptible at this early period, does not shew itself till a very late date. In the Medical Review for April 1800, Mr. Taynton gives the case of an infant, in which no appearance of success took place *till the twelfth day*; from which time it ran its course very rapidly. In the Medical Journal for May 1800, the Rev'd. Mr. Finch gives an instance of the pustule not appearing till the *eighth day*; and in another not till the *fifteenth*.

* Since writing the above, I have succeeded in exciting a spurious pustule. See the tables, case 1.

Doctor Cappe says, cases have occurred, in which there has been no appearance of a vesicle till the *ninth* day; and Mr. Ring has known two instances in which it did not appear till the *fifteenth* day; and one, not till the *sixteenth*. "It is however certain (says Mr. Ring, p. 339) that in many cases the disorder makes a greater progress by the seventh day, than it does in others by the twentieth."*

The Medical Committee of Rheims mention the delay of the appearance of success in Vaccination as far as the *twenty-second* day. See *Husson's Recherches*, p. 29.

By referring to case 6, in the tables, an instance will there be seen of this dormant state of the Vaccine virus for *eighteen* days. The Rev'd. Mr. Holt in the Medical Journal for 1799, mentions a curious fact somewhat analogous. "I inoculated, says he, near thirty, twice or thrice, apparently without effect, allowing an interval of five or six days; but though they sickened from the last incision, a pustule regularly appeared wherever I had formerly inoculated them, as if the dormant matter had been roused by the activity of that last inserted."

I may add to this, that I have since met with three or four cases in which the previous Vaccination came on, after a weeks interval, upon the successful progress of a second attempt.

The same variety exists in the Small-pox as in the Vaccine before success is apparent. Dr. Odier of Geneva mentions *seventeen* days; and Mr. Ring (p. 383) asserts that cases have occurred, where the symptoms of inflammation have not appeared till *twenty-nine* or *thirty* days after the operation.

As the appearance of inflammation, indicating the infection having succeeded, varies so considerably, so also does the *advance* of the pustule, now commencing its progress. In most cases a fluid cannot be distinctly perceived till about

* Where the pustule does not appear as early as usual, its progress is generally more rapid.

the fifth day. I have however had one instance in which I not only perceived, but actually obtained matter on the ninety-third hour from the period of Vaccination. As I obtained it without any difficulty, I concluded I might have discovered its existence six or eight hours previously, or three days and a half from inserting the infection.*

From what has been previously stated of the great variety in the progress of this disease, it may be readily concluded, that no absolute number of days from Vaccination can be fixed on, for taking the matter for future practice. I have taken it in one case from the *eighth* to the *fifteenth* day inclusive; from another, a patient of Dr. Hewson's, I procured matter on the eighteenth day, with which I produced a most perfect disease. I must however mention, that the progress of the Vaccine in the case of Dr. Hewson's above alluded to, had been suspended by the measles. As this case is considerably interesting, I have Dr. Hewson's permission to make the letter public which contains the detail.

“ Dear Sir,

“ On Friday the 17th of December last, I obtained on the point of a lancet, some of the Vaccine virus from Mr. M's child, and having previously moistened the same with a small particle of water, I inoculated Sarah Wattles aged ten months, and Maria Wattles aged twelve years. This was the order of the inoculation, which I have thought worth noticing, as in Sarah Wattles it did not succeed, but in Maria Wattles, where I was obliged *still further to dilute* the matter, the inoculation took effect.

“ On Thursday the 23d, (the seventh day) examining Maria Wattles' arm, I discovered a small limpid vesicle at the place of inoculation; the skin immediately surround-

* In this case the pustule did not advance more rapidly than usual to its termination. On the contrary I obtained matter till the tenth day inclusive, when the areola began its career. Case 43.

ing this vesicle was of a fine vermillion colour, and hard to the touch. The mother informed me, that she had observed some signs of inflammation the day before, when I had omitted to visit the child. The vesicle gradually increased till Wednesday the 29th, (thirteenth day) when I perceived a small scab in the centre. I immediately inoculated with the matter taken from this child, the children of Mrs. Levis, Maria, Sophia, and David, occupying the upper story of the same house. These children were brought down stairs for the purpose.

“ Upon repeated inquiries I never could learn, that the child suffered any general indisposition until the evening of Tuesday the 28th, (the twelfth day) when she was seized with sickness at her stomach and frequent vomiting. These symptoms continued the next day, when I found the skin hot and dry, and pulse frequent; I could not ascertain the number of strokes in a minute, the child being very restless. I ordered some antimonial wine as an emetic to be given in the evening, and requested the mother to give her the infusion of senna the following morning as a cathartic.

“ Tuesday the 30th, (fourteenth day) the medicines have operated freely; the child still continues fretful, and has considerable fever. The scab is nearly formed. I directed ten drops of antimonial wine to be given four times a day, mild diluting liquids to be drank freely, and the child to be kept moderately warm. On Sunday the 19th of December, (third day of Maria W's. inoculation) Alexander Wattles about eight years old, had brought the measles to the house. Delia Wattles had taken them on Saturday the 25th; and S. Wattles lay at this time in the cradle with all the symptoms of the measles. These circumstances led me to suppose Maria's indisposition to be the same disease; and this opinion was strengthened by the appearance of an efflorescence on Friday the 31st, (fifteenth day). It was not till Sunday the 2d of January, that any pustules appeared. They were confluent and left no doubt of the disease being the small-pox. The pustules began to dry on Tuesday the

4th of January, (nineteenth day of Vaccination) and the child went regularly through the disease.

“ I have already mentioned that I attempted to inoculate Sarah Wattles with the Vaccine virus. On the third day from inoculation I observed a small purulent pustule which disappeared on the fifth. She took the measles as related above. She had but just recovered of this disease, when, to wit, on Thursday the 6th of January, she was covered with a scarlet eruption, which I apprehended to be the small-pox. This though of the distinct kind, never filled properly, and at last proved fatal, carrying her off on the seventh day.

Two of Mrs. Levis's children, Sophia and David, took the Vaccine infection from the first inoculation. On Tuesday the 4th of January, (seventh day) I found them setting with Mrs. Wattles' children, the mother wishing them to take the measles. My anxiety was very great lest they might take the small-pox. On Tuesday the 11th of January being the fourteenth day after inoculation, Sophia Levis had a slight eruption on the face and breast, a dry husky cough, and a considerable flow of tears; the disease was very light. In this child the areola which usually accompanies the Vaccine disease did not appear till the *nineteenth* day after inoculation. It was on the eighteenth day that you took some matter from the pustule, and you will recollect that there was then no appearance of an areola. Upon inquiry I learnt, that you succeeded with this matter in giving the Vaccine disease.

“ With great respect and esteem,

“ Yours,

April 30th, 1802.

“ THOS. T. HEWSON.”

I believe the testimony of most Practitioners, is in favor of obtaining the matter as early as possible to insure success, as it is then supposed to be in its most active state. At what point we must stop, seems as yet to be undetermined. Dr. Odier, of Geneva, has considered it as most proper to

be taken when the efflorescence is complete; whilst the illustrious author of this important discovery, considers this efflorescence as a "sacred boundary beyond which the lancet should not pass." Again, Dr. Cappe, and others, consider the matter as proper for Vaccination as long as it continues limpid; and by others we are recommended to take the matter on the eighth day, or eight times twenty-four hours from the period of Vaccination: I have as above-mentioned, taken matter, in a case of the most perfect appearance and regularity, on the fifteenth day,* when the areola had *nearly declined*; this I have done in several instances; from one I took it on the twelfth day, when the areola extended perhaps full three inches from the pustule, which was beginning to decline. (Case 22.) These may suffice to shew its safety, where the matter continues limpid, and the scab has not too far advanced. Dr. Cappe says, Dr. Woodwille informed him "he had twice inoculated on the thirteenth day from patients, in whom the disease was so far advanced, that he could only obtain a little moisture from the margin of the scab; yet he was successful."

Were we to consider the presence of the areola, as the point beyond which we should never infringe, we should in frequent instances be unable to decide: How are we to judge when this "sacred boundary" does not exist, or how can we properly estimate its appearance in the dark skin of an African? As a general rule I think it may properly be retained; but we shall all, probably, in our practice, find exceptions to it. I should rather be disposed to adopt as a rule in taking the matter, that idea which restricts it to the eighth day. I speak of those cases which advance with due regularity; because this day embraces usually the most tardy, and most rapid cases. It will also for the most part be in unison with the former; but to this we shall likewise find exceptions, as the areola sometimes commences

* See p. 25.

on the fifth, sixth, and seventh days.* Although I would prefer taking matter at an early period of the disease; yet my opinion, formed from the few experiments I have made on this point, leads me to conjecture, that when the pustule has exhibited the character of the real Vaccine, no danger is to be apprehended from using the matter, even although the areola be formed, provided the fluid continues limpid, and the scab has not too far advanced: I should never hesitate to employ such matter, especially if none other offered.†

* If the pustule runs its *regular* course, though quick, it is a perfect preservative. And why should not this be the case as well as when its progress is preternaturally slow? Husson, p. 29, mentions the areola on the eighth day. If the areola always existed, and if its actual presence could be always detected, I think that it would be the most accurate criterion; but as this is not the case, so neither shall we find the disease on the eighth day in many successful cases, sufficiently advanced to procure infection, see p. 23, 24. of cases not advancing even as late as the twenty-second day: Hence the difficulty of fixing on any point of time, which shall be exempt from any irregularity.

† In the Medical Repository, Vol. V. p. 348, in answer to an inquiry on the necessity of establishing a point of time for taking the Vaccine infection, Dr. Waterhouse considers the limpid state of the matter as a fallacious criterion; giving as a reason that "in the rising of a vesicle from almost any cause, the scarf-skin separates from the true, and a portion of the *superfluous water* of the blood, and sometimes of the *coagulable lymph*, is found under it." He adds, "I have known this *limpid* fluid exude in considerable quantity from the Vaccine pustule that has been too much irritated by pricking, and exhausted of its virus. It gives a shining, glazy appearance to the thread." I cannot however acquiesce in this reason, because I cannot suppose any other vesicle is likely to be taken for the Vaccine; at least when it is more generally known. I do not think it probable that any person acquainted with the Vaccine would be liable to err on this point. And I must confess I do not feel satisfied with the idea that the limpid fluid exuding from the Vaccine pustule, which has been too much

In the quantity of matter to be obtained from a patient in this disease, great variety exists. In a disease consisting for the most part of a solitary pustule, it may be concluded, that in general, it does not amount to any large proportion §. In several instances, where from the beautiful appearance of the pustule I had anticipated the procuring a considerable quantity of matter; I have scarcely obtained sufficient to moisten the point of my lancet. This was the case with one of the most perfect pustules I have seen, although previously to its scabbing, I think it was upwards of one third of an inch diameter (See Case 38). In other cases however, a pock of less diameter than a small-pea|| has yielded much more matter than it appeared to me to be ca-

irritated by pricking, has been exhausted of its virus. How are we to determine the point at which we should cease to irritate the pustule by pricking it? I have not hitherto found the effect alluded to, nor do I apprehend much danger from it. If the matter is taken away *incautiously*, and *unnecessary* irritation is employed, I can suppose a change in the properties of the secreted fluid. I have mentioned a case in which I obtained matter daily from the seventh to the fifteenth day, or above a week; in which the areola had nearly subsided before my last attempt; yet, with perhaps forty or fifty punctures, the matter continued good to the last, as I proved by its efficacy, thirteen days after having been taken, in producing a disease which effectually guarded against the small-pox.

A thread when fully impregnated with the Vaccine infection, has always to me had a shining glazy appearance. A moderate solution of gum arabic will give an accurate idea of the Vaccine infection, on glass, on a lancet, and on thread. (See its Analysis, p. 32.)

Although I thus differ on this point from Dr. Waterhouse, I am satisfied of the propriety of establishing eight times twenty-four hours as the point of time for taking infection.

§ Although in most cases only a single pock appears, yet now and then one or more besides, occur. See case 11. 34. 42.

|| Dr. Husson says he has seen a Vaccine pock not larger than a pin's head; but which produced in another a pock of the usual size. The quantity of infection is by no means dependant on the size of the pock,

pable of containing at one time ; which satisfies me of the propriety of the opinion of Dr. Cappe, that it is partly supplied by secretion. It will often continue to exude for a considerable time from the small punctures made in the vesicle. One case I met with, in which the pustule, without being of uncommon magnitude, yielded sufficient matter to coat over a piece of glass, equal to about a square inch, three or four times amply, and to imbue completely a thread of more than a foot in length. Upon a moderate computation I should suppose it yielded enough to have vaccinated two hundred persons (See case 25).* In some few cases I have obtained matter five or six days successively ; and in the one above mentioned, eight days ; whilst others have yielded it only one, or at most two days. It is therefore of the highest importance to pay great attention to secure the matter at the proper time, and never to suffer an opportunity of taking it to pass. From inattention to this point, I have heard Physicians asking for Vaccine infection, who but a week before, had said they had under their care several cases in the finest state for taking it. Their mode was simply to depend on the quantity they obtained on the point of a lancet, for a succeeding Vaccination. This is not the method to secure so perishable an article. Physicians will without great attention, have to lament its loss when they most desire to employ it. I shall in a future part endeavour to point out the best mode of preservation.

I cannot perhaps in any part more properly than here, introduce a chemical analysis of the Vaccine matter made by citizens Husson and Deputren, and given to us in Dr. Moreau's " Historical and Practical Treatise on Vaccine Inoculation." (See Ring p. 790.) This Analysis although ingenious, does not seem likely to be of any practical advantage.

* I supplied upwards of twenty Physicians with matter from this case alone.—I might have procured much more from it, if leisure had permitted.

"When exposed to the air, it readily dries, without losing its transparency. It acquires the hardness of glass; and forming a scale, *adheres like a varnish* to the surface upon which it is applied. It oxydates iron. If left to dry in the Vaccine vesicle, it forms itself into small and hard globules. When liquid, it readily dissolves in water; and when solid it enjoys the same property.

"When exposed to heat, it presently becomes turbid; exhales a slight odour of carbonate of ammonia; and is soon converted into a light cellular charcoal. It produces no alteration in the colour of syrup of violets; nor in that of tincture of turnsol.

"When tried with alkohol, nitrate of mercury, nitrate of silver, or nitric acid, it affords a white precipitate; which will neither dissolve in potash, nor in the muriate of Ammonia. The concentrated sulphuric acid, oxalic acid, the vapour of oxygenated muriatic acid, potash, barytes, and muriate of ammonia, neither produce the least action upon it; nor alter in any manner, its external qualities. It seems to consist of, water and albumen; of which the proportions are not known."

To this I may add, that it does not appear to me to possess any taste; though it seems to have the glutinous sensation of a gummy solution, leaving a slight degree of that asperity on the tongue, which is produced by unripe fruit.

With respect to the constitutional effects in this disease, there is considerable difference in time and degree. In infants as far as I have seen they have been almost invariably light. Indeed in several instances I have been unable to ascertain the slightest indisposition. Even in a variety of instances where they were teething, or had slight complaints of the bowels, the symptoms did not appear to me to be greater, than might reasonably be ascribed to the accompanying irritation.

Dr. Jenner has recorded (p. 137) that the Vaccine virus was inserted into the arm of a child about *twenty* hours old, who went through the disease without apparent illness, yet

was found effectually to resist the action of variolous matter with which it was subsequently inoculated." I vaccinated my youngest child when only three weeks old, in whom, although the areola extended nearly from the shoulder to the elbow, I discovered no marks of indisposition during its progress; yet he has withstood the variolous action in three successive inoculations by six punctures, as well as by exposure to a man labouring under the Natural Small-pox. I cannot however, though so fully acquiescing in the truth of the benignity of this disease, accord with those gentlemen who consider the constitutional disease by no means essential to the permanent efficacy of the Vaccine. It appears to me an absolute truth, that a constitutional affection must occur, however slight it be, to produce the astonishing change we find effected in the system. It seems utterly impossible a mere local disease could suffice to produce this general effect. I shall however extend this argument by stating, that the Revd. Mr. Holt, in the Medical Journal for December 1799, has mentioned the cases of William Neil of ten years, and Hannah Beal of six years of age, who had each above *one hundred* pustules in different parts of their bodies, which assumed precisely the appearance of that given by inoculation, except that they were smaller: no complaint of more than *ordinary* indisposition was made in either case." Eight children vaccinated from the matter of these pustules had the disease in the mildest form. These cases, whilst they evince the mildness of the Vaccine, shew the existence of a constitutional affection, without which such a general eruption could not have occurred. I have met with one case in which about the eleventh or twelfth day, a true Vaccine pustule formed upon the inside of the right knee: now there can scarcely exist a doubt in this case of a constitutional affection; yet it was so very slight, that, except the pain of the axilla, it was not to be perceived (case 42.) On these cases then I would ground my

opinion, that a constitutional effect must take place, to secure the system from future danger of Variolous infection.*

This fortunate exemption from, or rather moderation of febrile action, is however, not universal. In various instances, even in children, the symptoms are considerable, tho' rarely sufficient to produce alarm. The pain arising from the inflamed and tumid state of the axillary glands, in many instances is considerable for a day or two, or even longer; tho' where it exceeds a moderate degree, it appears generally to depend on the too free use of the arm whilst the glands are in the above state; and hence it usually is greater in adults than in children, because they are unwilling to suspend their daily occupations. This is not however always the case, for we often see examples of continued labour, without the slightest increase of the constitutional affection, even when this is apparent.

When the pain of the axilla exists, I have generally observed a pain of the part vaccinated, extending upwards to the axilla, as if in the course of the lymphatics. This pain is sometimes very considerable, being accompanied with a burning or stinging sensation, and with more than usual tumefaction and hardness of the surrounding cellular membrane.

The absorption of the virus differing as we have seen very materially in different people, it may reasonably be supposed, (as really is the case) that considerable variety exists in the commencement of the axillary inflammation and subsequent indisposition. It is in the actual state of inflammation of the axillary glands, that an imprudent use of the

* No one I believe will doubt the necessity of a general affection of the system in the small pox, to secure it against a future attack: most Practitioners must have either seen, or read of cases of a perfect local variolous pustule, which by no means proved a preventive to the future attack of this complaint. I shall in a subsequent part give some very strong instances of a second attack of small pox, neither of which were merely local; but attended by every requisite which can prove a constitutional affection.

arm may tend to prolong the disease; and hence I have seen the pain continued for full three weeks; accompanied with considerable tumefaction of the arm, and a blush of inflammation, extending to the wrist and above the elbow.

The febrile symptoms vary very considerably. I have already mentioned that in some persons, especially children, they are not evident; whilst in others, the disease has been accompanied with all the intermediate grades of drowsiness and head ach, up to chills, pain of back and limbs, and even nausea and vomiting. This is seldom the case; so seldom indeed, that I must confess, I believe with Dr. Jenner, these violent symptoms arise not necessarily from the disease, but from the accidental irritation and consequent inflammation of the vaccinated part. In confirmation of which I can safely affirm, the only considerable cases of fever I have met with in this disease, have arisen *after* the tenth and twelfth days; when an ugly sore has been induced by rubbing off the scab in its forming state, or great inflammation has taken place by the irritation of rough clothes, &c. Previous to this, a moderate degree of febrile indisposition and axillary inflammation was all that was complained of; whereas at this period, great fever, head ach, pain of back, nausea and vomiting, took place. I shall have occasion shortly to say more on this point; I shall only add at present, that this occurrence is not uniform, even when continued irritation would lead us to anticipate the most disagreeable effects. In one case of a black child of about a twelvemonth old, about the fourth day, the apex of the small pustule which was forming was rubbed off, and this was successively the case every day or two, nearly seven or eight times, owing to her tight and rough clothes. She had a slight indisposition on the eighth day with pain in the axilla, the former of which I ascribed to her teeth, three of which came through at this period, and though I fully expected a disagreeable sore, yet by the sixteenth or eighteenth day it was nearly dried away, without producing any inconvenience. About a month after this, I inoculated

the child for the small pox, under a firm persuasion that she would take the infection; the three punctures I made inflamed slightly, and advanced to the state of pustules, which never completely matured, but dried away about the eleventh or twelfth day, without producing any eruption, or any febrile indisposition (case 18).

From the earliest appearance of the pustule, a slight degree of inflammation surrounds its base. This scarcely appears to enlarge, except from accidental irritation, till towards the close of that period when the constitutional effects seem subsiding, and which in most of the cases I have seen was on the tenth day. At this period it begins to augment pretty rapidly; in some instances, it has not diverged from the tumour more than half an inch, whilst in others it has extended from two to four, five, and nearly six inches. This inflammation, known by the name of the efflorescence and areola, is mostly of the same circumscribed circular appearance of the pustule, but at times it diverges unequally. Its existence does not seem to be essential to the perfection of the disease, although its presence is desirable, from its being most frequently present. It was for a considerable time regarded as a proof of the certainty of the constitutional influence of the disease on the system; which, without its presence was viewed as a mere local affection. Mr. Ring however expressly mentions, that he has known "several cases where there was a total absence of areola," yet in none had he known the patient capable of receiving the infection of the small pox. I have seen two cases of this kind, both of which have since been ineffectually inoculated for the small pox; so that I feel perfectly assured of the efficacy of the Vaccine, even when unconnected with this peculiar appearance.

I have stated that the areola does not always occur: I have also remarked, that a moderate degree of inflammation surrounds the base of the tumour from its commencement, even when no areola follows. As these two grades therefore seem totally unconnected, although the areola

when it takes place, appears only to be an extension of the former, I have occasionally noted it down under the name of the *secondary* inflammation, to distinguish it from the primary or permanent one. The induration of the surrounding skin is more or less considerable as the areola advances, and generally declines as the efflorescence recedes. I have already mentioned the difficulty of ascertaining the presence of the areola in the black skin of the African. In the mulatto it is in most cases sufficiently evident. I have always considered the above mentioned tumefaction and induration of the surrounding skin as the sole criterion of its existence in the negro. As I have met with several instances of the absence of this state of the skin in the negro, I have considered it as evincing the non-existence of an areola. The two cases above mentioned were white, in whom I could make no mistake on this point: I leave it to be verified therefore, by those whose greater sources of observation on the negro, may qualify them to determine it.

As I have seen cases in which no areola existed, so I have also met with several instances, both of its early and tardy appearance. The early advance, as may be supposed, is in those cases which have been followed rapidly by the subsequent changes. This was remarkably the case in my own person. By the commencement of the fifth day, two very fine pustules were progressing, with an efflorescence of nearly one fourth of an inch, at which period, I experienced considerable head ach and drowsiness; on the sixth day, these symptoms had augmented, and shooting pains, extending from the pustules to the axilla, were plainly perceived. The axillary glands were slightly enlarged. The efflorescence had advanced considerably, with slight tension and tumefaction of the parts. By the eighth day the areola was between two and three inches in extent from the pustule, or about five inches in diameter; by the 10th day, or the usual time of the areola forming, the pustules were nearly scabbed over, of a dark mahogany colour; the efflo-

rescence had gone entirely by the twelfth day, and one of the scabs fell off on the fifteenth, and the other on the sixteenth day, both leaving a second scab beneath, which fell off on the twenty-third and twenty-eighth days.

Another instance came under my notice, of a child whom I vaccinated *nine* times before infection took place (case 9). From this child on the seventh day I obtained matter. On the 8th a scab was forming with a slight areola, which was perceptible the preceding day. About the sixteenth day the scab fell off, leaving another beneath. On the twenty-first day I inoculated her in two places with variolous matter, taken the preceding day from a patient labouring under the natural small pox. The punctures slightly inflamed for three or four days and then gradually dried away. It is remarkable in this case, that the matter I employed for Vaccination which took effect, was taken on the eighth day from a child, in whom the areola did not occur till the eleventh; which last case was vaccinated with infection taken on the *eighteenth* day of the disease, one day only antecedent to the areola.* In one other case the areola began on the seventh day, and by the ninth was nearly gone, the scab being partly formed (case 42). It may not be uninteresting to add, that this case I vaccinated with infection taken from a secondary pock on the arm of her sister, about two inches above the original one, on the twelfth day from vaccination, and the third or fourth of its appearance. About the tenth or eleventh day, a Vaccine pock appeared on the inside of the right knee. This case I have before adverted to, and these are the only two cases I have met with, of any other pustule than on the vaccinated part; I except the appearance of pimples which are not uncommon.

* I notice this to prove, that the early or tardy appearance of the disease, does not influence such as are produced from its infection.

mon, and which probably may depend on the Vaccine. Variolous inoculation failed in this instance.†

I cannot tell the latest period of the appearance of the areola. I have mentioned a case above from which I took matter on the eighteenth day, at which time the areola appeared just commencing (Dr. Hewson's letter, p. 27). I have seen it several times as late as the twelfth day.

It might be supposed the efflorescence would occur quickly, in proportion to the rapid progress of the pustule,—but this does not seem to be the case. In the instance formerly noticed as yielding matter on the latter end of the third day, the areola did not commence till the tenth day; nor did the scab complete itself before the usual period. Case 43.

The heat of the vaccinated part appears to be considerably augmented; how much the thermometer would indicate, I have never tried. A more troublesome attendant on the areola than the heat, is a violent sensation of itching. It is of a burning stinging kind, resembling I think the sting of nettles; and requires the utmost exertion to avoid scratching. This itching sometimes extends several inches. It is generally bounded by the circumference of the areola,* and is one of the most unpleasant symptoms, though not always equally violent; in children it has to me appeared a chief

† In one case which came under my care, an inflamed circle commenced about the beginning of the fifth day, extending by the evening to nearly an inch from the pock; but by the evening of the sixth, it *had totally disappeared*, and the true areola did not commence till the close of the eighth day. I could not ascribe this appearance to any particular cause, and it is the only instance of the kind I have seen.

* Though it is generally towards the close bounded by the extent of the areola, yet we find it occasionally appearing at an earlier period, as the fifth, sixth, seventh, &c. days, before the areola had commenced, and extending then to two or more inches from the pustule. Perhaps the extent of the itching may generally denote the future extent of the areola, as I have noticed in several instances. I have seen it decline before the areola commenced.

cause of their fretfulness and anxiety, even when the febrile indisposition appeared but very trifling.†

In addition to the varieties existing in the appearance and magnitude of the areola, its continuance may also be mentioned, as differing in different persons. It mostly however begins to recede about the twelfth or thirteenth days; commencing frequently from the centre, and gradually advancing to the circumference, so as to leave a ring of inflammation at some distance round the pustule. The declension of the areola is nearly as rapid as its progress, leaving the skin for a short time of a dingy hue; at least I have repeatedly seen it.‡ A desquamation of the cuticle to the extent of the areola generally follows.

The change of colour which takes place in the centre of the pustule about the close of the tenth day, in consequence of the contained fluid beginning to dry away, indicates the commencement of the process of scabbing, which is mostly complete in two or three days; that is to say, a darkish hue has by this time extended over its surface. The pock gradually hardens, becoming of a dark brown, mahogany, or chesnut colour, exhibiting a fine polish and of the same circular, or oval, appearance with the pustule. In about ten days or two weeks, if it is not previously rubbed off, the fluid below having been totally absorbed, the scab begins to separate at its circumference from the surrounding skin; it then soon falls off, leaving the skin below perfectly sound, though mostly with a depression or pit. In some cases the scab falls off before the fluid is perfectly absorbed, leaving consequently, a surface not completely healed, on which a second and

† This itching frequently continues troublesome although lead water or other cooling applications be employed. I have lately received a letter from England, in which I am informed, bathing the inflamed part with *rectified spirit of wine*, or *ardent spirits*, has succeeded immediately in removing it. I have not yet tried its efficacy.

‡ Sometimes the areola declines in such a manner as to leave an external ring of inflammation, and an internal one adjoining the pustule. (See the plate, twelfth day.)

sometimes even a third and fourth scab successively form, without any inconvenience or uneasiness.

It sometimes happens, as I have before stated to have been the case with myself, that the scab forms at a much earlier period, even so soon as the seventh and eighth days: it falls off proportionably early. In other cases no disposition to form a scab exists as late as the fifteenth, sixteenth, and seventeenth days; even though the areola had commenced at the usual period, and continued not longer than is common. In the case I several times have adverted to (case 26) from which I obtained matter on the fifteenth day, the areola appeared on the thirteenth, but less regular than usual, on the fourteenth day the patient exerted himself very considerably at a fire in handing buckets, after which a red streak of the size of his finger was very conspicuous, running from the pustule to the axilla (doubtless exhibiting the course of a lymphatic), but not accompanied with any pain: on the fifteenth the areola was nearly gone, but there was no appearance of a scab. The pustule all this time was increasing, being at this period very nearly half an inch in diameter. On the sixteenth a scab commenced, which did not come off till the fifth week from vaccination, and then left a second scab below: I might have procured matter two or three days I believe longer than I did, but I was fearful of inducing a spurious disease.* In another case the areola commenced about the eleventh day, continuing the twelfth, thirteenth, and fourteenth, during all which time the pus-

* With this matter I vaccinated at the same time two children, in one of whom the scab did not form till the fifteenth or sixteenth day, when the pock was nearly half an inch in diameter. In the other the scab progressed at the usual time (see case 33, 34.) All these facts convince me that perfectly limpid matter from a perfect pustule may at any time be taken before the scabbing commences. I do not however mean to recommend it. One thing is remarkable in the above cases; that the matter failed in both, in the first attempt, when it was eight days old, but succeeded in the second attempt five days later.

tule increased considerably, and continued so to do till the seventeenth day, when it was more than one-third of an inch in diameter; it now began to scab, and rapidly increased. In this case I tried to obtain matter from the pustule previous to the commencement of the areola, but it was scarcely enough to moisten the point of my lancet, though the pustule was as beautiful as I have seen. I did not try after the areola commenced; but I apprehend I might have secured some on the fifteenth and sixteenth days.

These appear to be the varieties of the regular disease; I must not however omit to mention that I have met with several cases, in which from five or six, to twenty or thirty small pimples arose in the vicinity of the vaccinated part, continuing for about three days, and then gradually declining without filling with any fluid. I considered them as arising from local irritation. It is mentioned by Ring and others as occasionally occurring.† Whether they ever fill, and assume a Vaccine appearance I know not, but rather imagine this to be the case; in case 34, on the ninth day several little pimples broke out about the vaccinated part and above it. By the twelfth day they all had disappeared but three, of which one assumed the true Vaccine character; from it I transferred the disease to another person. It is to be noticed that these secondary pustules advance rapidly to their acme, and as rapidly decline. The above-mentioned pustule had a scab nearly complete by the termination of the fifth day. Although the Vaccine eruption, independently of the local pock, is a very rare occurrence, yet sufficient proof exists that such an eruption occasionally takes place. The above case is in point. The child vaccinated from it, had also a true Vaccine pock on the right thigh. These are the only cases I have seen; but President Jefferson in his letter to Mr. John Vaughan mentions two or three of about two hundred cases, who had from two to

† These are the same kind I apprehend which are mentioned by Dr. Jenner (see p. 13), and which are represented in the plate on the tenth day.

half a dozen pustules on the inoculated arm only.* The Rev'd. Mr. Holt I have mentioned above as giving two extraordinary cases of above one hundred pustules each, (see p. 33.) As for the pustules which appeared in London at the first introduction of the disease, little doubt is now entertained of their having been variolous. Dr. Woodville is I believe entirely of this opinion at present. It does not appear, that the infection of the true Vaccine pustulous cases is more disposed to produce a violent disease than if taken from the local pustule.

In two or three instances in infants, about the sixteenth day, I have noticed a few minute pimples or specks on the face and neck, resembling flea-bites which gradually disappeared; whether they were any way connected with the Vaccine I cannot say. I have seen also about the same period a nearly similar eruption, but more numerous upon the head of an infant of two months old, which appeared to be attended with considerable itching: it declined however in a few days. I do not think these were any more than accidental concomitants of the disease. I have seen a similar eruption on the twenty-first day, and on the fifteenth, in two children vaccinated on the same day and with the same matter. An eruption on different parts of the body, as a scarlet efflorescence, has also been mentioned by some authors. I have never seen it.

Having thus given as concise a view of the origin, as also of the general appearance, the progress and the varieties of this extraordinary disease, which have come under my own notice, as was in my power. I shall say a few words on the medical treatment.

“Much of the hazard incurred in the small-pox is owing to a larger eruption upon the skin than the constitution can support,” as Mr. Aikin has justly remarked. This however is not the only source of danger. The febrile symptoms,

* Probably these might be only pimples of the nature abovementioned; I have not learnt if any came to maturity.

even when scarcely followed by a dozen pustules, are often accompanied by convulsions of the most alarming nature. Neither has the small-pox been rendered so perfectly safe by inoculation as some pretend to assert, as to enable us to insure its successful termination. Those Physicians therefore, who oppose the Vaccine under the plea of the absolute safety of inoculation, must either be totally ignorant of the disease they profess to understand, or wilfully blind to the hazard incurred, from the narrow principle of self-interest. I shall however attempt to prove to the satisfaction of even these narrow-minded Practitioners, that it is as much their interest as their duty, to employ this, the mildest of diseases, in preference to one of the most destructive maladies of the human race. It has been estimated that one person in two hundred dies of the inoculated small-pox, and this is perhaps not much out of the way on a large scale. Now if we consider the total inhabitants of this globe as amounting to a thousand million, we may calculate that the one-fiftieth part die annually, and a like number receive existence. Of this fiftieth part or twenty millions (supposing the whole number were to be inoculated for the small-pox) the above calculation of one-two-hundredth part falling a sacrifice to its fury, will yield a total annual mortality of one hundred thousand persons. When however we view the ravages of the Natural Small-pox, especially in the vast regions of Africa where medical advice is scarcely known, it would be found that not less than one in ten (many calculate one in six to die with the natural small-pox) or two million annually, fall victims to this dreadful disease. As this calculation is only made on a supposition of a perfect regularity in the premises laid down, I shall take surer ground, by stating from the authority of Dr. Lettsom, that *two hundred and ten thousand* persons annually die of the Small-pox in *Europe alone*. And Dr. Herman Mc. Donald asserts that it proves fatal to *forty millions* in every century. In France it is calculated that one in fourteen dies of the small-pox. The total number of deaths in a year is estimated at nine

hundred thousand on an average, of which upwards of *sixty-four* thousand are of the small-pox.

Dr. Moreau informs us sixteen thousand persons died of the small-pox at Naples in one year, and twenty thousand at Paris in another. In England thirty thousand perhaps are (were) carried off annually by the small-pox. How grateful to the feelings of the illustrious discoverer of the efficacy of Vaccination must the reflection prove, that to him will mankind owe the preservation of so many lives !

These strong and demonstrable truths must I think carry conviction to every mind, that great indeed is the moral obligation of Parents and Physicians, to save this immense population to the world, by the general introduction of the Vaccine ; a disease, which most assuredly, has never of *itself* proved fatal to a single person. What must be the feelings of a parent who with these facts before him, (not founded on the assertion of an individual, but confirmed by the testimony of thousands of witnesses, the most respectable for their talents and situation), what I ask must be his feelings, when he sees a beloved infant writhing under the tortures of this foe to mankind, without having even given him a chance to escape by shielding him with this “ægis of Jenner ?” If a parent’s feelings can thus be wounded by self conviction ; how much more intensely should that Physician suffer, who, duly impressed with the certainty of the preserving influence of the Vaccine, should lose a patient by inoculation ! For my own part, I freely own, that with my present views on this subject, I should feel myself accessory to the death of the patient ; and nothing but inability to procure the Vaccine infection, would ever now induce me to recur to variolous infection, *antecedent* to Vaccination, in which case I should regard it as the less of two evils.*

* I may perhaps add another exception to this general determination. I mean the inability by repeated attempts to produce the Vaccine. See case 30, whom I vaccinated *fourteen* times ineffectually, previously to any attempt to inoculate. He has resisted one attempt to excite the Small-pox.

It appears to me most extraordinary, that every parent does not anxiously seize the opportunity of giving their helpless offspring a chance to escape the ravages of the Small pox. The simple act of substituting the minutest speck of Vaccine or Variolous infection, may prove the means of future happiness, or a source of bitter reflection, and too late repentance. If beauty in a female is desirable in the eyes of a parent, how much reflection is necessary before those pleasing prospects are blighted by the Small-pox! Even were it proved the Vaccine was not the preservative it is, what ill is to be apprehended from a disease, so slight as to exceed the range of possibility, to suppose, that death could be induced by it?

How eccentric is the conduct of mankind! With testimony in favor of the Vaccine ten thousand times stronger than would be required by the most prejudiced person, to convict an individual in a court of justice, is it not surprising the slightest objection can be advanced against it? Can we be surprised at the disbelief evinced by many in the Holy Scriptures, though so strongly attested; when we see this propensity to scepticism so prevalent on a subject, the truth of which every one has it in his *immediate* power to verify, and which appears to stand on a foundation as strong as Christianity itself?

What shall we say of the conduct of those Physicians, who, without any endeavour to investigate the truth of the doctrines advanced respecting the Vaccine, arrogantly assume to themselves the privilege of denying its merits altogether, or else assume as a fact that its prophelactic properties do not exceed the limits of a few years? Such Physicians there are, (if they deserve the title) and not many miles from this metropolis, who thus strive to check the progress of this invaluable blessing. If they wilfully reject the firm basis on which it stands, they certainly deserve the detestation of mankind: if it arises from ignorance, we must pity the fate of such, as trust their lives in the hands of those, who will not take the

trouble to render themselves acquainted with the facts they thus presume to oppose.

That it is the interest of Physicians to employ this in preference to the small-pox, will I hope be rendered evident when I come to consider the difficulty of procuring and preserving the infection. On those two points I rest the argument; because I am well satisfied none but Physicians will take the necessary trouble to effect these ends, or with but few exceptions. Those who are objects of charity must still continue such, whether the Vaccine or the Small-pox are employed; and those who can afford to recompense a Physician for his labour, will scarcely take the disease into their own hands, merely to save a trifling expence.*

But to return from this digression. It may readily be imagined, that a disease so mild as the Vaccine, very rarely requires the aid of medicine, indeed I might say, never, as far as it respects the mere disease. Perhaps nineteen of twenty scarcely exhibit a perceptible indisposition: during the period of dentition, or in slight complaints of the bowels, I have in several instances had reason to suppose the febrile symptoms were not increased by the accession of the Vaccine. In adults, they are occasionally more considerable; but even they, suffer but little uneasiness which a dose of cooling physic is not capable of removing.

Dr. Jenner says (p. 98) "from the very slight indisposition which ensues in cases of inoculation, where the pustule, after affecting the constitution, quickly runs into a scab spontaneously, or is artificially suppressed by some proper application, I am induced to believe, that the violence of the symptoms may be ascribed to the inflammation and irritation of the ulcers (when ulceration takes place to any

† The danger of producing a spurious disease in place of the genuine pustule, should also have its due weight with those who are disposed to take the disease into their own hands.

extent, as in the Casual Cow-pox), and that the constitutional symptoms which appear during the presence of the sore, while it assumes the character of a pustule only, are felt but in a very trifling degree." At (p. 103) he adds "that the most material indisposition, or at least that which is felt most sensibly, *does not arise primarily from the first action of the Virus on the constitution, but it often comes on, if the pustule is left to chance, as a secondary disease.*" He further adds (p. 109) "As the cases of inoculation multiply, I am more and more convinced of the extreme mildness of the symptoms *arising merely* from the primary action of the virus on the constitution, and that those symptoms which (as in the accidental Cow-pox) affect the patient with severity, are entirely secondary, excited by the irritating processes of inflammation and ulceration." I am happy to have the authority of this celebrated character on this important point; and as far as my experience goes, I most unequivocally coincide in the above remarks. All the cases which have proved any way disagreeable, have been those, where from inattention the scabs have been rubbed off and ulceration produced. And this leads me to say a few words on this head, as it regards the symptoms and medical treatment.

It has been observed that in a majority of cases, the process of scabbing follows vesication with the most perfect regularity. In these cases little indisposition is perceptible; but when from inattention or from any other source, the scab is either rubbed off, or the pock is much irritated; violent inflammation sometimes follows, accompanied with considerable tumefaction, extending to a greater or less distance, sometimes even up to the shoulder and down to the wrist; great pain of the part vaccinated, shooting up to the axilla; to which succeed inflammation and swelling of the axillary glands, chills, fever, restlessness, anxiety, nausea, vomiting, head-ach and pain of the back. These symptoms in part, or successively, increasing, usually subside in a few days of themselves, though now and then a

case of greater violence will protract itself one, two, and even three weeks. It is however uncommon to find it so violent as not speedily to yield to a gentle antiphlogistic treatment, in which may be included due attention to the local complaint, which by this time has probably put on the state of a disagreeable phagedenic ulcer; sometimes with a luxuriant growth of flesh, shooting up nearly one-third of an inch above the surrounding skin, and very tender to the touch. The axillary glands I have seen swelled nearly as large as a pigeon's egg, and accompanied with an erysipelatous inflammation over the whole limb; the ulcer at the same time pouring out a considerable quantity of a limpid fluid for the most part, but occasionally of a purulent nature: When the disease has got to such a height, (which it seems incapable of doing without a successive series of negligence and topical injury), it requires some active application to arrest its progress. In three or four cases which have come under my notice, I have found nothing equal to the unguentum citrinum. The mercurial and the red precipitate ointments are much recommended. In milder cases lead water, or Goulard's extract, will generally prove effectual. When the inflammation and pain are very great, it is necessary sometimes to poultice the sore; in one instance a poultice of the marsh mallow, applied without my advice, seemed to give more relief than the usual bread and milk poultice. It is seldom I believe, that the above mentioned ointments applied night and morning to the *surface of the sore only*,* will not cause it to assume a healthy state in a few days; lead water or merely cold water to the inflamed limb may be applied at the same time with advantage. Some smart purgative every day or two, and abstaining from animal food and liquors,

* I saw one case in which the unguentum citrinum, applied incautiously over the surrounding inflamed skin, seemed to destroy it, and thereby augmented the sore. When applied solely to the ulcer its effects were very advantageous.

will generally produce a cure in a short time, or so dispose it to heal, that any common dressing will suffice.

I have been much surprised to see the small cicatrix which has remained after such a disagreeable ulceration; indeed it would seem as if it was incapable of exerting so much violence on the skin and cellular membrane as the Small-pox; although its appearance in such violent cases is I think nearly as alarming as that arising from the Small-pox. I form this opinion from the case of a mulatto woman who came under my care, and whom I vaccinated in two places of the fore-arm (case 25); the infection took effect, and by the fifth day, the punctures were raised into two purulent looking pustules, not of the regular Vaccine form. As I had not a doubt of the spurious nature of the disease, I repeated the Vaccination on the same arm at about two inches distance from the former. This attempt produced one of the most beautiful pustules I have seen, and *little indisposition attended*. About the cessation of the attending symptoms, notwithstanding my strictest caution, I found her nursing a child, and otherwise using her arm, by which the true Vaccine pustule was rubbed off, and the crustaceous scabs of the spurious ones also. From this moment the symptoms increased; and ran to the extent I have above enumerated. The arm was swelled most enormously, and the pain and enlargement of the axillary glands was very alarming. The steady application of the citrine ointment, and one or two strong mercurial purges, soon relieved the most urgent symptoms; and though the sores had extended themselves to above three-fourths of an inch, yet in less than a week they were reduced nearly one half, and the whole was perfectly well in about six weeks from the first Vaccination. In another instance, a child of two years of age, the pock which progressed in the most favorable manner, was unfortunately rubbed considerably on the seventh day, and this was repeatedly the case till the tenth and eleventh days, when the indisposition, till now trifling, became very serious: the inflammation and

swelling increased rapidly, and the pain was very severe. In this case it was that the axillary glands became nearly as large as a pigeon's egg. The sore looked very ugly, and required constantly to be poulticed for several days, during which it was with difficulty I could persuade the mother to force down a dose of physic. It soon began to assume a better appearance, and by the end of the fourth week was nearly covered with a hard dark coloured scab. I must observe that this child was of a very gross habit of body, and much troubled with worms. Being anxious to see the regular progress of the disease, I did not restrict the child in his diet during this period. The weather was at the same time very variable, cold and wet,* and the child always out in the street. These circumstances will tend in some degree to account for the violence of the symptoms.

Where proper precautions are adhered to, I believe but few instances of such violence would take place: indeed if the sore is taken immediately in hand, lead water would in nine cases of ten prove sufficient to check the further progress. If the inflammation after the twelfth day should continue, lead water seems all that is required, and not even then, unless it should seem to increase; for till that period, it is only progressing as it ought.

It has been proposed by some, after this period, to check any further disposition in the pock to spread, by applying some active corrosive substance for a few seconds, by which cicatrization is forwarded and danger of ulceration is prevented. The sulphuric acid on the head of a probe is recommended to be held a few seconds to the pock and then washed off. Of its efficacy I cannot speak, as I have not tried it; being more desirous of seeing the natural progress of the disease

* Upon referring to the other cases which have proved troublesome, I find they all took place in the same state of the weather. And it has been observed in England that a cold N. E. wind produced an aggravation of the inflammation.

than to check it. Mr. Aiken has given a judicious caution against its premature use, lest it should entirely extinguish the disease, before the constitution is rendered secure against the Variolous infection.

In the above mentioned cases the cicatrices were very small compared with the apparent ulceration. I must add, that nothing like convulsions appeared in any instance, although the symptoms ran so high. How different from the Small-pox! I may indeed ask in *what do they agree?* I think I may say in nothing! Whatever proves bad in the Vaccine, is not essential to, but an *accidental concomitant* of the disease; whilst what is good is exclusively its own. On the contrary, the Small-pox is bad from beginning to end, without a single admixture of good to recommend it; and not unfrequently leaving a remembrance of itself to the termination of life.

I cannot refrain from adding the character of the Vaccine, as drawn by the enthusiastic but masterly hand of Mr. Ring. "As to the genuine disease, if disease it can be called, on the third day it resembles a flea-bite; on the sixth a crystal; on the tenth a pearl; on the twelfth a rose;—a rose without a thorn!

"The vesicle which it displays, may be considered as a gem of inestimable value; and the fluid which it contains, a precious balm. How enviable is the lot of that man, who has put the world in possession of such a treasure! It is to himself an inexhaustible source of happiness; and to the land which gave him birth an eternal monument of glory." See p. 748.

As the preservation of this matter is of the highest importance to mankind, it is incumbent on every Physician to pay the strictest attention to this point, more especially those who live in the country, where a failure might be with difficulty supplied. Disappointments will often occur, even when every precaution is taken to insure success. Matter will frequently fail, though employed immediately after being taken from a pustule, at the earliest period:

this I apprehend must depend in a great measure on an indisposition to receive the impression of the disease; we see the same in the Small-pox; and the same diversity exists in different persons, and in the same person at different times, with respect to the application of medicines.

This torpor, or whatever it may be, is unaccountable perhaps, though the fact is certain. I have in a former part mentioned a few remarkable instances of this kind.

Though the Vaccine infection fails perhaps more frequently in a first attempt than the Variolous, I do not so clearly perceive that it is more perishable. What would be the greatest period of time at which Small-pox matter would succeed, I do not exactly know. The Vaccine has proved effectual at the end of three months according to Dr. Jenner; and Dr. Marshall succeeded with it after as long a period. I received a portion from England which proved successful, though it must have been nearly three months old. These circumstances appear favourable, but I suspect it would not often be the case without the greatest precaution.* Four portions of matter which I received from England, failed in taking effect though put up with the minutest care. Matter which has been taken but a very short time, (not above a day or two) has failed in the hands of Practitioners to whom it was sent at but a few miles distance from town. Other portions have proved successful which have been sent off under similar circumstances. When it is to be immediately employed, perhaps the lancet is the best mode of conveyance; though I am not so satisfied on this head as I was, because the matter is very insoluble, and I apprehend is seldom so thoroughly dissolved, as when united with water by a lancet point on a piece of glass. If it is taken on a lancet, it is improper to allow it to remain more than a very few days, because it very soon rusts the iron.

* By referring to case 47 in the tables, it will be seen that I had some reason to believe I succeeded in exciting the Vaccine with infection almost four months old, which I had paid no particular attention to preserve from the air.

The method I have employed to preserve the infection has chiefly been on thread and glass. I have taken it on thread mostly for the purpose of sending to Practitioners at a distance from the city. I have generally inclosed the thread in a piece of paper, and surrounded it with gold-beater's skin, so as to transmit it readily in a letter by the post; or I have thrust the paper into a quill, and after stopping it with a cork, have surrounded this with gold-beater's skin. In a few instances I have sent the matter on a piece of glass, which I have fitted with a piece of talc or isinglass, and coated with gold-beater's skin; and again I have put the impregnated thread between two plates of isinglass and coated it as before. All these several ways have I believe succeeded.

For my own use, I preserve it between two plates of glass which I coat as above; and I have always taken the precaution to note down on a piece of paper with which I surround them, the name of the patient, together with the day of the disease, and that of the month, by which means I am able to trace up the disease to its primary source: I have never omitted when it was in my power, to procure the first portion of matter, and thus secure it for my future use; after which, I have procured it for others.

An ingenious mode, which is pursued by a Practitioner of this city, is by applying to the punctured pustule, a capillary tube; by exhausting the air with his lips, the fluid which exudes is forced up into the tube. This is then stopt with wax, or some other substance. To vaccinate with this, after making one or more punctures on the arm, the end of the tube is applied, and a fine wire pushed down, which carries the limpid infection before it and deposits it on the punctured part. By this mode of preservation, evaporation is entirely prevented, and the infection continues fluid. How long this may be the case I know not. I apprehend however some danger is incurred of the putrefactive process commencing in the tube, in consequence of the atmospheric air contained. This, though small in quantity, is large in

comparison to the portion of infection which has been drawn up, I know of no mode by which a vacuum is to be maintained there. Messrs. Ballhorn and Stromeyer* have proposed the vacuum of a barometer to secure the infection on thread. Time will shew if the above objections are well founded. I have not yet pursued the plan, but think it deserves attention.

The most certain method of transmitting the infection to a distance is doubtless by a patient having the disease upon him; the sources of failure however are so numerous, that it behoves every Practitioner to attend most closely to its preservation whenever he has obtained it. I think it of sufficient importance to specify the various sources of failure of infection in this disease, which at present occur to me.

First. It arises from the inattention of Physicians themselves, in not securing the matter when once it is in their possession, but depending for a future supply from their more attentive neighbours; this is an evil which I hope will cure itself; as I think Physicians will soon discover their error in depending upon others for a supply.

Second. It fails from the mode of preserving it, as on the point of a lancet, if not employed in a few days.

Third. With every disposition to secure it, it fails because a Physician cannot always insure a succession of patients; in consequence of which the matter loses its efficacy before it is again employed.

Fourth. It fails from the premature destruction of the pustule, by being rubbed off.

Fifth. Sometimes with the most favourable appearance, the pock will yield little, if any infection.

Sixth. From the mildness of the disease, we can never insure finding the patient in the way at the proper period for taking it.

* *Traité de l'inoculation de la Vaccine*, p. 79.

Seventh. It happens that from an indisposition to receive the disease; really active matter will produce no effect in one person, though in another it will succeed. §

Eighth. It may be taken at too late a period of the disease.

Ninth. Drying with too considerable a degree of heat, as by the fire, which destroys its activity.

Tenth. The true Vaccine will sometimes produce a spurious disease in one person, though it would not in another, (Case 1. Note).

Eleventh. A rough and unskilful mode of performing this apparently trifling operation, by exciting considerable inflammation, may destroy the disposition to receive the impression of the disease, and hence prove a source of failure.

Twelfth. The last and most extraordinary source of failure is, that which arises from parents not permitting the matter to be taken from their children. That such an occurrence should take place is wonderful, when it is considered that only one pock in general is produced! This it must be allowed is a most impolitic plan. How can a parent expect to be supplied with infection, when he refuses it to others! It is not in this disease as in the Small-pox, which preserves itself by its contagious nature, or which often produces such abundant crops as are sufficient to inoculate a whole town. I do not think a person who thus refuses to extend the benefits of this disease, ought ever to partake of them; but should be doomed to suffer under the severity of the Small-pox. Nor could he complain; because he is aiding this insidious disease, by not opposing it; or at least by shutting up the means of opposition in his power.

§ We even see this in the same person, when of two or three punctures, made precisely in the same way and with the same care, only one will take effect. The *same matter* also, will with similar precautions fail in the same persons, in one attempt, which will succeed at a later period. See cases 33, 34.

Many persons suppose that taking the matter is productive of a sore arm. This is not the case as hundreds can testify. Nay more, it appears when done cautiously to be useful, by taking away that matter sooner, which must otherwise be absorbed in a more tedious way. The few cases of sore arms I have met with, have been where I have taken the matter but once or twice; and I have I believe in nearly a dozen cases, obtained it from four to eight days successively without detriment. I hope these observations may prevent the frequent occurrence of an evil of such magnitude to the community. It may easily be supposed, that what happens to one person, might to another; and it is only extending the refusal to every Practitioner, and how soon should we have to lament the loss of this invaluable blessing!

It is from the above considerations, that I have anxiously endeavoured to establish an institution for the Vaccine inoculation. Hitherto I have failed. Many have supposed it may be preserved by the charitable institutions already existing. Little difficulty it is true has yet occurred: by considerable pains I was enabled to preserve the infection till the period of inoculation was approaching; by which time it had extended its influence among my fellow Practitioners: many were anxious to participate in the blessing, and the disease consequently kept its ground. But now the season for inoculation declines, the infection may not so readily be procured, from its being out of the power of Physicians to insure a constant succession of patients;* and if even one or two could do so, it can scarcely be supposed they will occupy their time in securing matter for those, who by inattention and neglect have lost it to themselves.

* Although Vaccination may suffer a temporary decline during the warm weather, yet every season is nearly equally proper; and no doubt the period will soon arrive, when such will be the confidence placed in the mildness and efficacy of the disease, that no particular time of the year will be considered as preferable to another.

I must lament the want of such an institution, which is established in almost every city of note in Europe; and which example New-York and Baltimore have wisely followed. I anticipate the establishment of one here, when the difficulty of preserving the infection, *pure* and *permanent*, shall evince its propriety.

The great difficulty of procuring and preserving the infection, is the argument I proposed to advance, as proof of its being the interest of Physicians to employ the Vaccine; for it is incredible that it can ever be long in any hands but those of the medical profession, as none but Physicians, and but few of them I fear, will take the necessary trouble to preserve it*. Hence I think those persons are in a great error, who consider the introduction of the Vaccine in opposition to the Small-pox as inimical to their interests. Were this even the case it is of small weight in the balance of humanity.

With respect to the best method of Vaccinating I shall say but little. The mode I have almost invariably pursued has been by puncture; which mode, from the less degree of injury, I apprehend, is more likely to induce the genuine disease in all its native elegance, than when an extraneous body, such as thread, is suffered to be retained, and consequently to produce occasionally, local irritation not connected with the Vaccine; of this however I am not positive, for some of the most beautiful pock I have seen have been excited by means of thread.

When I have not employed the fluid infection, I have generally moistened the dry matter on glass. This requires much care, owing to its difficult solubility. With a lancet thus armed, I gently raise the cuticle from the skin beneath, forming a small triangular pouch, into which I introduce the infection, which thus lays as it were com-

* How can it be properly ascertained also, by any but those who are conversant with the disease, whether they produce a spurious or genuine pustule?

pletely enveloped. It is by no means requisite to draw any blood in the operation. On the contrary, where the system is disposed to receive the impression, the less the injury to the tender extremities of the absorbents, the better. In a few instances it has progressed most delightfully, though at the time of Vaccination I was altogether unable to distinguish the puncture I had made; hence I have, occasionally, from a desire to introduce more of the infection, produced, by unintentionally wounding the cuticle in another part, two pustules. This shews the facility of inducing the disease in some instances, in contradistinction to those difficult cases I have before noticed.

To dilute the infection I have constantly employed *cold* water; not that I consider it more proper than warm water, as some do, who view the matter in so *volatile* a light; but the idea of using warm water appears to me absurd, when we consider the quantity taken upon the point of the lancet is so small, that it must have acquired the temperature of the atmosphere almost before it is brought into contact with the infection it is intended to dilute; and certainly long before it is inserted into the arm. Whether warm water was originally employed to give a greater air of mystery to this simple operation, I know not; I am however perfectly satisfied it is altogether unnecessary.

I have said above, that it is unnecessary to draw blood: I may however add, that a small quantity will not prevent the action of the infection.

As this disease is comparatively new in this extensive portion of the globe, it will certainly not be deemed improper in this place to take a short view of some of the most important facts, which substantiate its prophylactic powers against the Small-pox, in order to combat the opposition it may experience from ignorance or intentional misrepresentation; as well as to remove the fears, which have unfortunately been excited against it, by the introduction of a spu-

rious disease in several parts of America ; which fears have as yet by no means subsided.*

To accomplish this end, I shall notice in the first place the testimonial in its favor which was brought forward in London, and signed by more than fifty Physicians, and double that number of Surgeons, gentlemen of the highest reputation in the profession. This example was followed in various parts of England with the greatest advantage ; and such a testimonial should also be signed by the Physicians of America, who know the value of the Vaccine, in order more speedily to diffuse it. The following is the testimonial.

“ Many unfounded reports having been circulated, which have a tendency to prejudice the public against the inoculation of the Cow-pox ; we, the undersigned Physicians and Surgeons, think it our duty to declare our opinion, that those persons who have had the Cow-pox, are perfectly secure from the future infection of the Small-pox.

“ We also declare, that the inoculated Cow-pox is a much milder and safer disease, than the inoculated Small-pox.”

To render this testimony more strong it may be observed, that several of the gentlemen who have thus given it their decided support, were in the first instance strongly opposed to the disease : As it may be reasonably presumed they did not change their sentiments without the most perfect conviction, this testimony is certainly of the strongest kind.

The Rev'd. Mr. Jenner related to Mr. Ring (p. 606), that he had vaccinated about three thousand persons. “ At Burbage in Wiltshire, where he had inoculated (vaccinated) about half the inhabitants of the parish, the small-pox since raged, and swept away a number of persons ; *but all those who had been inoculated by Mr. Jenner escaped, as if sacred from the ravages of that destructive pestilence.*” To this “ se-

* This part of the subject is earnestly recommended to the attentive consideration of those whose minds are yet undetermined respecting the merits of the Vaccine, whether they be Parents or Physicians.

vere test" of the efficacy of the disease, as Mr. Ring calls it, I shall add the following letter from Dr. Farquhar to me, in answer to an enquiry I made upon the subject, and which with his permission, I made public at the time, in hopes of exciting the confidence of the public in the Vaccine.

" Philadelphia, Dec. 16th, 1801.

" SIR,

" WHOEVER makes the investigation of medical science the object of his pursuit, and its application for the benefit of mankind the end of his wishes, is certainly entitled to the gratitude of his fellow-citizens. The advantages of Cow-pox over the Variolous disease having been so fully proved, your exertions for its introduction here, are highly laudable. In reply to your enquiries respecting Vaccination in Jamaica, I beg to inform you, that matter having been about eight months ago procured from England, inoculation immediately took place; since which period many thousand persons have undergone the disease. Of this number about *twelve hundred* were inoculated in the parish of Trelawny, who (*excepting about thirty, in whom after repeated inoculation no symptoms of disease occurred*) had the complaint *so mild*, that during its continuance they were enabled to follow their usual avocations. Of the *thirty* before alluded to, upon being inoculated with Variolous matter, *fifteen* had the Small-pox; but although, in order to ascertain the truth of the Vaccine proving a certain exemption from the Variolous disease, *every person*, who had been previously inoculated for Cow-pox, *afterwards underwent the same operation with Variolous matter, in no one instance did the disease follow*, when the presence of Cow-pox had been previously correctly ascertained. Among the advantages of the Vaccine disease over Small-pox, are, its *never having in any one case terminated fatally*; its requiring *no previous preparation* of either regimen or medicine; its being attended with so slight indisposition as

scarcely to constitute a disease; its being produced by inoculation only, and consequently never contagious. It differs from Small-pox also in this, that a person may have the complaint more than once; it however sympathizes with Small-pox so far, that when a Variolous atmosphere prevails, *its symptoms are considerably more severe*; and its proving a certain exemption to that disease is now so fully proved, that *it has ceased in Europe to be doubted.* Innovations in medicine have ever met with opposition; it is not then to be wondered, that there are those who have withheld their sanction from the introduction of Cow-pox: Its advantages are now, however, so well established, that we may reasonably hope Small-pox in a few years will be known only by name. Indeed, when we reflect that *under all the advantages of art the Variolous disease sometimes terminates fatally*, and that of many hundred thousand cases of Cow-pox in Europe, *no one person* has ever been known to die, we cannot but consider Vaccination as one of the most beneficial discoveries in the annals of medicine: And that your well meant endeavours to extend its advantages may be crowned with success, is the wish of,

“ Sir,

“ Your very obedient servant,

“ GEO. FARQUHAR, M. D.

“ Of Clarendon, Jamaica.”

“ Dr. J. R. COXE.”

An interesting experiment was published here also, translated from the French papers, fully substantiating the fact, this I also shall introduce as of the highest importance.

From the “ Journal du Commerce,” a Paris Paper of the 24th November, 1801.

“ General Committee of Vaccine.

“ A long and important experience having entirely convinced the committee of the very little danger attending the inoculation of the Vaccine (or Kine-pock,) there remained

to ascertain more particularly its preservative effects, and to find out whether its duration, respecting which some doubts had been entertained, would extend beyond the revolution of a year. In order to make this experiment with all the care and the authenticity which it deserves, the committee assembled together as great a number as they could possibly find, of the ablest and most eminent doctors of physic. It now publishes the result of the counter-experiments made in their presence, upon one hundred and two children who had formerly been vaccinated.

“ Verbal-process of the counter-experiment.

“ We the subscribers, being invited by the central committee of Vaccine to attend the process of a counter-experiment which it had in contemplation to make, by inoculating with the Small-pox a great number of individuals who had previously been inoculated with the *Vaccine*, met accordingly at the house of citizen Thouret, Director of the Medical School, on the 23d and 30th Vendemaire, 7th, 19th and 30th Brumaire, year 10, to witness the experiment and to examine into its results. In each of the four first sittings, the committee presented us a person having the Small-pox well characterised. The matter which served for the inoculation was at each time taken out of the pustules, and introduced in our presence, by three incisions at least, to every individual who had been formerly vaccinated.

“ Thirty-seven who submitted, the 23d Vendemaire, to the Variolous inoculation, have been attended by several amongst us, until the 30th of the same month, and visited the same day by every one of us. The punctures were dried up on twenty-four: The other thirteen had some local effect, characterised by a hard tumid redness, with a small suppuration at the puncture. The dessication was complete on the 6th Brumaire, the thirteenth day after the insertion. It has been satisfactorily proved that during the whole time no febrile affection has been experienced, and there was not on any of these individuals the least sign of general disease, or the smallest appearance of eruption. It

is necessary to add, that most of the children had on very coarse linen and thick harsh clothes, the friction of which seemed to us to have considerably increased the degree of inflammation which manifested itself at the incisions.

“Twenty more have been inoculated on the 30th Vendémiaire, with the same precautions as the first thirty-seven; that is to say, with matter taken from a Variolous patient then present; on the 7th Brumaire the punctures were extinct on nineteen; one only presented, like the preceding thirteen, a local effect, which had completely disappeared the 12th Brumaire, being the twelfth day from the insertion.

“Twenty-five more underwent, on the 7th Brumaire, the same Variolous inoculation. The 15th (the eighth day of the insertion,) no marks could be traced of the punctures on twenty-three; the two others presented yet some symptoms of local inflammation, resembling that above mentioned, and which did not continue longer.

“Lastly, on the 19th Brumaire the experiment was ended by inoculating in the like manner twenty individuals. On the 30th of the same month the punctures were dried up on eighteen. Of the two others, one presented on each arm a hard dry brown scab. The second showed on the right arm two rounded regular pustules, the borders of which were still lightly inflamed, full of a purulent matter and having a Variolous aspect. These two patients, attended every day by two of us, have had no symptoms of fever, nor any appearance of a general eruption. It is necessary to observe that at the moment of the inoculation of these two, they were undergoing an anti-venereal treatment.

“It follows from this experiment,

“1. That out of one hundred and two individuals, formerly inoculated with the Vaccine, (several of whom had been so for a year, and some others even for near eighteen months) the Variolous inoculation has produced no effect on eighty-eight of them. 2d, That the temporary inflam-

mation noticed at the punctures of the other fourteen, has not been followed with the Small-pox, as no symptoms of fever, uneasiness, or eruption were perceived on either of them. 3d. That in the last case, the pustules of a Variolous appearance were the effect of a local action, similar to that which can be excited by inoculating the Small-pox on individuals having formerly had that malady, and which will also be often contracted, even after having had it, by Physicians and nurses attending upon Variolous patients. 4th. Finally, that it is natural to conclude the Vaccine has preserved from the Small-pox the one hundred and two individuals who had been inoculated with it in our presence.

“Signed, in Paris, the 30th Brumaire, year 10, (21st November, 1801). Maloet, Descemet, I. Roi, Andry, Montaigu, Barrie, Delaporte, Roussille-Chamseru, Rousset-Vanzeme, Doctors of the ci-devant faculty of medicine at Paris :—Portal, Halls, Jussieu, Fourcroy, counsellors of state :—Parmentier, Huzard, Tessier, members of the national institute :—Sue, Dubois, Chaussier, Petit-Radel, professors of the medical school :—Heurteloup, Biron, Vergez, La Croix, of the council of health of the armies :—Bichat, Anvity, Dupuytren, Alibert, of the society of the school of medicine :—Tourdes, professor of the school of medicine of Strasbourg :—Sedillot, jun. of the society of medicine of the Louvre :—Ruffin, Bertin, Le Blanc, Leveille, Bourdette, Moreau (de la Sarthe.)

“The committee wishes, if there remain any objections to set forth against the Vaccine, that they may be founded upon facts as well authenticated.

“Signed, by all the members of the committee, Paris, 30th Brumaire, year 10. Thourer, President; Guillotin, I. I. Leroux, Pinel, Doussin, Dubreuil, Salmade, Desches, Jadelot, Marin, Parfait, Mongenot, Husson, secretary.

“A true copy,

“(Signed) HUSSON, Sec’ry.”

Mr. Ring who is very sanguine in the cause, had at the time of his writing vaccinated about 800, and speaks of its proving efficacious in every instance wherein he tried it.

To these I shall only add, that I have now tried its efficacy in above thirty of my patients who had been previously secured by the Vaccine. In most instances I made two or three punctures, with Variolous matter recently taken from persons labouring under the natural disease; and in several instances I repeated this two, three, or four times added to which, I have exposed several persons to the chance of taking the Small-pox, by causing them to visit patients labouring under heavy burdens of that disease. The result was an uniform opposition to the variolous contagion. In two or three instances alone a local pock took place on the inoculated part, unaccompanied by eruptions or any febrile indisposition. This it is well known will frequently occur by inoculation after the Small-pox itself. By far the greatest number however died away, so as in four, five, or six days, to leave no trace of the attempt: Among these I am happy to add, was an infant of my own, who was ineffectually inoculated three times, after passing through the Vaccine at three weeks old; since which he has been held for above one-fourth of an hour in the arms of a man, then full of the Variolous eruption. Convinced as I was before, this was only an additional cause of gratitude to the illustrious discoverer of so great a blessing; whose name I have endeavoured to render familiar to my family, by prefixing it to the surname of the infant above mentioned.*

I might go on to transcribe beyond all bounds, the numerous facts which testify the absolute efficacy of Vaccination in preventing the Small-pox. This is however quite unnecessary; for whoever will not yield implicit belief to

* The number of persons Vaccinated in London, amounted in August 1800, to fifteen thousand, of which five thousand had been inoculated without effect.

the testimony already adduced, would not be convinced, though one should rise from the dead.

As many have imagined the Vaccine is only a temporary security from the Small-pox; I shall endeavour to point out the error of this impression, by merely noting down the names of various persons who have, at an early period of life taken the *Casual* Cow-pox, by milking an infected cow, and who have been repeatedly exposed to the hazard of the Small-pox both natural and inoculated.

	<i>Years.</i>		<i>Years.</i>
<i>John Phillips</i>	53	<i>Joseph Merret</i>	25
* <i>Mr. Williams</i>	50	<i>Richard Haydon</i>	25
† <i>Mr. Crocker</i>	40	‡ <i>Mrs. Hutchins</i>	20
<i>Eliz. Wynne</i>	38	§ <i>Mr. Deacon</i>	16
<i>Mary Barge</i>	31	<i>Mrs. Thurkle</i>	14
<i>Sarah Portlock</i>	27	<i>Wm. Struchcomb</i>	10
<i>Hester Walkley</i>	26	<i>Mr. Collinbridge</i>	10

Mr. Fermor in his "Reflections on the Cow-pox" is full of similar facts from three to 36 years.

These are surely sufficient to establish the fact: But as time advances, facts increase to prove its efficacy, whether produced by inoculation or in the casual way. Ring mentions one of five years standing by inoculation, and hundreds may now be enumerated. As therefore it has, when

* This person has thirteen children who have all had the Small-pox, and he himself, besides attending them during their illness, has been four times ineffectually inoculated.

† This man has been frequently exposed to the Small-pox ineffectually: he is a plumber, and has soldered up coffins containing those who died of it.

‡ About five years after, she was inoculated, with one hundred others: All took the disease but herself, during which she attended to them. Since this she has nursed eight or nine persons in the Small-pox, three of whom died, and were laid out by her.

§ Ten years afterwards he and his family were inoculated. One of the children died, the rest had it badly: He escaped.

taken casually, preserved the system nearly sixty years; and as the early cases of Vaccination still continue to oppose the Small-pox, we must regard all opposition on this head as mere cavil, and treat it with the contempt it merits. I will however go so far as to say, that if it was proved to be a preventive for only ten years, it would be an object of the highest importance; for what comparison can be drawn between the ferocious Small-pox and this mild disease. I would rather suffer Vaccination every year, than run the hazard of inoculation once in my life.*

To estimate more fully the superiority of the Vaccine, it is only necessary to observe, that neither heat nor cold are objections to its use; damp cold weather is to be avoided, though it is not very material.† Teething in children need not cause any apprehensions as to its issue; nor do I indeed, from what I have seen or read, know any situation which would prevent my employing it. Women within a few days of parturition, have been safely subjected to it, and Dr. Jenner mentions an infant of only twenty hours old, who had undergone its influence. I need not enlarge here on the feelings of a parent when witness to the sufferings of an innocent victim to the Small-pox. Fever, frequent convulsions, the numerous pustules at times, the disagreeable object, the chance of pitting, anxiety, and fatigue of body and mind; all form a striking contrast with the benignant Vaccine; which causes no emotions but those of gratitude to our SUPREME CREATOR, for thus kindly counteracting one of the greatest scourges of the human race.

I have not as yet said much on one of the most essential points of difference between the two diseases, viz. the non-contagious nature of the Vaccine. It is this which renders it

* If the Vaccine was not invariably a preservative against the Small-pox, it would only *then* be on a par with this last disease, of which I shall hereafter give some strong cases of a second attack.

† See note, p. 51.

so great a benefit to mankind. The fact is confirmed by numerous examples in the practice of almost every Physician who has seen the disease. Dr. Jenner in a letter to Mr. Ring says, "by no means that I could devise, have I been able to infect a person by the effluvia of the simple Cow-pock pustule, although I have tried several. Among others, I have suffered children two or three times a day to inhale by the mouth and nostrils the effluvia of pustules on the arms of others, when the matter has been in its most active state, and the pustules punctured in several places to give the matter its fullest effect." (p. 84).

It is unnecessary to enlarge on this point. Every Physician must have witnessed the fact; I have had repeated instances. I shall only add, that independently of the value arising from its non-contagious nature, so mild a disease is it considered, that in the Army and Navy of Great Britain, the persons Vaccinated, are not considered proper subjects for the sick list.

It is a surprising fact in the history of this extraordinary disease, (for such it is in whatever point we view it), that although it is a most perfect preservative against the Small-pox, it is not so with respect to a second attack of itself; neither is it prevented universally, by having previously undergone the Small-pox. It has already been observed, that like the Small-pox, it is communicated with much more ease in one instance than in another. The cause of this singularity will perhaps never be developed. In all probability, they, whose systems are opposed to one disease, will likewise oppose the other.

Although I have had the disease in my own person in the most favorable manner, yet as some have supposed it to be merely local, I shall not depend on this alone to prove the fact, but shall briefly enumerate several instances from Jenner, Ring, and others.

Dr. Jenner at p. 20 of his Inquiry, relates the case of Wm. Smith, who had the disease in 1780, 1791, and 1794, which was equally severe in each attack; and at p. 47,

he gives a yet stronger instance of Eliz. Wynne "who had the Cow-pox in the year 1759, was inoculated with Variolous matter without effect in 1797; and again caught the Cow-pox in 1798."

Dr. Jenner supposes "the susceptibility of the virus of the Cow-pox is, for the *most part*, lost in those who have had the Small-pox, yet in some constitutions it is only *partially* destroyed, and in others it does not appear to be *in the least* diminished." To this remark he adds that some "have had the disease in the most perfect manner," and gives a very strong case of this kind which had been presented to him by Mr. Fewster, p. 165: &c.

In addition to these facts, Mr. Ring asserts p. 135, that many years after having undergone the Small-pox, he succeeded in exciting a perfect Vaccine pustule on each arm of his nephew Mr. John Ring: At p. 121, he gives us another example, where a lady was inoculated, in jest, by her husband, with Vaccine matter taken on the point of a needle from one of her children, and had the disease in the *most perfect manner*, and accompanied with *head-ach* and *fever*.

I shall not take up time in referring to more cases. I will only add, that I have seen no pustules more perfect than those which appeared on my own arm, and on that of a student of medicine who having had the Small-pox previously, vaccinated himself successfully with infection from the arm of his fellow-student (see case 10,) who had the disease excited in him by matter from one of my pustules.

Although several persons have thus successfully excited the Vaccine disease after Small-pox, I must not omit to add that such experiments more frequently fail. The following extract from a letter of Dr. Waterhouse on this point, is of sufficient importance to authorise my introducing it here. It is dated Cambridge, March 28th, 1802.

"From all that I have hitherto found in the English publications, and from my correspondents, I am induced to say, that the greatest weight of evidence is on the side of that opinion which maintains, that *he who has actually*

gone through the Small-pox can never have the Kine-pox; and all the experiments I had hitherto made, added to this weight. I nevertheless determined to make a few more trials, as experiment alone must decide it.

“ I accordingly inoculated seven persons with Kine-pock matter who had gone through the Small-pox, myself being of the number, four others were in my own family; the other two in the neighbourhood. By the fourth day I was able to pronounce, that six of them would not have the *genuine* Vaccine pustule. They inflamed *too quick*; the inoculated part resembled the sting of a bee, and wanted the requisite hardness, as well as that deep-seated, well-defined, and slowly-progressing affection, which characterises the genuine incipient pustule. Add to this, on the eighth day the inflammation surrounding the puncture was rather an erysipelatous blush than the beautiful efflorescence depicted in the engraving I sent you.* In thirteen or fourteen days the affection on the arm vanished, leaving scarcely any mark behind. I forgot to mention that although they had pain under the arm, they had not the least febrile symptoms. Six or eight months ago, I inoculated six children in one family, one of whom had had the Small-pox. The difference in the pustules was striking through every stage, but near enough to deceive the unexperienced. Limpid matter was in all of them, and I presume I could have communicated the genuine distemper with equal ease from either.

“ But, what shall I say of my own case? Mine was almost totally different; I had inoculated myself in the hollow space between the finger and the thumb of my left hand, (between the *abductor indicis* and *adductor pollicis*), and I thrust into the same part of my right hand a splinter, or small fragment of wood, in order to see the difference between the operation of a poison and a simple extraneous substance.

* This is the engraving from which the plate is copied, which is introduced into this treatise.

“ On the fourth day it had every mark of the perfect incipient Vaccine pustule. On the fifth day it had still stronger characteristic signs of the true pustule, in so much, that I should not have hesitated in pronouncing it as such, in an ordinary case. On the sixth I had pain and swelling under my arm, and a perfectly pellucid fluid was found in the vesicle. On the evening of the seventh day I had, or conceived I had, a dizziness and nausea; so that had I written to you on the subject at that period, I should not have hesitated in saying that I was under the true disease, notwithstanding I felt confident, that I received the true Small-pox by inoculation from the skilful hands of the venerable Dr. Redman in 1774: but had I written twenty-four hours later, I should have retracted the opinion, because at that period, when the pustule ought to have increased in turgescence, and to have blazed forth in the form of a bright efflorescence, it became flaccid, faded, gradually subsided, and vanished away, pretty much as the Variolous inoculation does after the Vaccine. Had the local affection increased on the eighth and ninth days, and the constitutional symptoms been augmented, I should have joined in opinion with you, that a person could go through both diseases perfectly; but at present my experience is against it, and you will understand I mean only to speak of my own experience.

“ A little girl in this town, who had been inoculated for the Small-pox in her infancy, took some of the Vaccine virus on the point of a needle from the arm of a servant-maid in the family, on the ninth day from Vaccination, and with it pricked her own arm, merely out of sport. The infection was perfect, and the distemper went on regularly through the three requisite stages of vesication, efflorescence, and scabbing, and the coincidence of symptoms was exact. I never saw a more perfect case of the Kine-pock. With matter from her arm I communicated the genuine disease to a third person. This, to me extraordinary occurrence, determined me to make a critical inquiry into the circumstances of her inoculation, both of her family and of her ino-

culator, and am entirely disposed to believe that *she never had the genuine but spurious Small-pox.*

“ From my own case, may we not infer that the Kine-pock virus is capable of vaccinating the skin and of raising a genuine pustule, and of affecting the lymphatics as every other acrid matter will, with redness, swelling and pain; but that the susceptibility of the constitution to its action was destroyed twenty-eight years ago by the Small-pox, which seizing on its appropriate *pabulum* consumed it so entirely, as not to leave enough behind to rekindle on the application of the Variolous or Vaccine flame? or should this savor too much of the old humoral pathology, let us say if you please, it was by destroying the Variolous, or peculiar *excitability*, or susceptibility to a second impression: How else can we account for the apparently perfect, yet short lived and abortive pustule that was raised on my hand? We see it was incapable of going out its full time, being void of certain requisites essential to its perfection; otherwise the lymphatic, sanguiferous, and nervous systems, would not have refused their action, and forbid that febrile commotion which seems to constitute the very essence of exanthematous disorders. Dr. Jenner is of opinion that persons who have had the Small-pox are susceptible of the Cow-pox *only in a small degree*. So they are of the Small-pox itself *in a small degree*: If it be found on deliberate experiment, that those who have really had the Small-pox are not *in general* liable to the Kine-pock, excepting in a slight degree, I think it of some importance to have it known. If there occur cases that appear to be exceptions, they should be carefully watched and as carefully recorded. Such cases I rank with those where a person has had the Small-pox twice, which although very rare indeed, I have no doubt have occurred.”

Of this letter I can only say, that as I certainly experienced the *full* effect of the Vaccine in my own person, I am less disposed than Dr. Waterhouse, to consider the previous

disease of the little girl, as a case of spurious Small-pox. Nor can I altogether concede, that the Doctor's own case was not a perfect one, though uncommonly rapid and unaccompanied by an areola. Indeed I have a very confident hope, that Dr. Waterhouse is on the point of embracing the opposite doctrine from that which he here maintains; at least I judge so from the following extract of a letter with which he has lately favored me, of the date of May 26th. "I have lately received a *well attested* case of the Kine-pock after the Small-pox from Vermont. The subject was a medical gentleman. The question *still remains sub judice*."*

* As the great rapidity of the disease in the Doctor's own case, appears to influence his belief on this point; I am induced to add the following case, in addition to others which may be seen in the tables, as a convincing proof, that the disease may be very quick in its progress, and yet be a certain preservative against the Small-pox.

Elizabeth Gallagher, aged 28, a servant at the Philadelphia Dispensary, was vaccinated at 11 A. M. of Thursday, May 13th, with recent infection from a child on the 10th day of the disease, at which time the areola was at its height. One puncture was made on each arm, and one on the right fore-arm. On the 14th, a pimple appeared at each puncture attended with considerable itching. On Sunday the sixteenth she experienced drowsiness, with pain of head and back; On Monday seventeenth (fifth day), nausea and vomiting, and a perceptible areola; on Tuesday, pain and swelling of the axilla, the areola extended full four inches downwards to the wrist, (on the right fore-arm), and united above with that which formed around the pock on the arm. The inflammation was considerable, and Saturnine applications were employed. On Thursday evening (eighth day), a scab commenced on the pustules, and was nearly complete by Friday afternoon. A part of the pock on the right fore-arm at its circumference still contained a limpid fluid, which I employed in vaccinating, but it failed to infect. On Monday, twenty-fourth (twelfth day), the scab of the left arm came off; that on the right was separating round its circumference. On Tuesday, twenty-fifth (thirteenth day), I inoculated her with *recent* Variolous matter in three places of the left fore-arm. They swelled and inflamed for a few days, and then died

After what has been said of the mildness of this disease, and the absence of the areola in many instances, it may perhaps be difficult to fix upon any absolute criterion of the existence of a constitutional affection. The fact is however so; and it appears to demonstrate the improbability of the supposition of the Vaccine and Small-pox being originally the same; or rather that the Vaccine is the parent stock, from which the Small-pox has deteriorated, its difference only depending on the length of time in which the latter disorder has passed through various constitutions in the human race. That this is not the case, is rendered certain in my opinion, not only from the existence of the Vaccine after the Small-pox, but also from our knowledge of the inveteracy, and contagious nature of the Small-pox, ever since our first acquaintance with it; These appendages have been *constantly* uniform and not *progressive*, in a long series of years: we cannot therefore suppose it to have originated from the Vaccine, and gradually to have acquired its present malignancy; as we must at the same time suppose it to be worse at present than at any preceding period. Could we even get over the idea of its gradual deterioration, how is it possible to account for the contagious property of the Small-pox, and at what distance of time from its supposed source, the Vaccine, did this extraordinary property commence? This property we ought on the same principles to find increasing: but no one will contend the Small-pox is a more violent disease at present, than it was a century ago.

The reverse of what happens, we should rather expect; for we might readily imagine, a priori, the more violent Small-pox would be capable of amelioration, and that besides preventing a recurrence of itself, it might also prevent the Vaccine: But we could not so readily expect this mild

away and disappeared. On the thirty-first they were gone; when it was again repeated with a similar result. It may be proper to remark, that from Thursday the thirteenth to Tuesday following, she had an unusual flow of the menses; what influence it had on the disease I know not.

disease to be a perfect security against the Small-pox, and yet neither to be an absolute guard against its own recurrence, nor yet to be invariably prevented by the more violent Small-pox. As fact however proves the truth of this; it serves to shew how little dependence is to be placed upon Theory, when it departs from the broad and firm basis of experience, to revel in the fertile fields of fancy.

A very important caution remains yet to be pointed out, viz. that the Vaccine is *by no means to be considered as an absolute preservative against the Small-pox, unless the system has been completely guarded by it, previously to inoculation, or exposure to the natural contagion.* This cannot perhaps be the case before the ninth or tenth days.* If a person be inoculated in one arm for the Small-pox, and in the other for the Vaccine at the same time, he has surely no right to expect the extinction or even suspension of the one by the action of the other. Both at this period exert an equal sway on the system, for neither have a prior claim: and hence, in all probability, both diseases will run their course together; though from the accounts of authors, and from several cases which have come under my care, I am induced to believe the Vaccine prevents the Small-pox at this early period; and that when it is not prevented, its symptoms are for the most part moderated. I shall here be pardoned for introducing a case, in which I was satisfied the Small-pox was suspended by the progress of the Vaccine, but resumed its course after the termination of that disease. (See case 14.)

On the evening of the 23th of November, I was desired to see a woman labouring under a violent attack of fever which had continued three or four days. The next morn-

* If a person at this period be exposed to the Small-pox, as the system is not perhaps completely guarded; certainly it should be no objection to the Vaccine, if we should find the Small-pox shewing itself in the course of two weeks, that is, twenty-four days from vaccination.

ing, she was covered with an eruption of Variolous pustules. She then told me, that precisely two weeks before (November 14th), she had visited a friend in the same chamber in which a person lay ill with the Small-pox. Her husband accompanied her but went no farther than the door; near enough however to see the person abovementioned. As he had never had the Small-pox, I resolved to give the efficacy of the Vaccine, a fair trial, and immediately vaccinated him, by two slight incisions of the left arm, in which I deposited a portion of infected thread, ten days old. By the commencement of the third day, it had evidently taken effect. As he was constantly in the room with his wife, I put him on a low diet, and gave him occasional doses of medicine: he did not however abstain from his daily labour. On the evening of the seventh day he complained of pain and swelling of the axilla, which increased till the ninth day and then gradually subsided. On the eighth day the Vaccine pustule afforded me matter in considerable quantity; and there was much pain in the part shooting up to the axilla. This night he had a considerable degree of fever which continued all the next day, and towards evening was accompanied by pain of the head and back, and also with nausea and vomiting. On the tenth day several Small-pox pustules made their appearance on the face, arms, and breast, from which period the fever declined, both diseases progressed distinctly, and by the fifteenth were drying away. By the seventeenth he was quite well. Indeed he suspended his daily labour (of sawing) for only about three days. The day of the Variolous eruption was the tenth of the Vaccine, and twenty-five days from his exposure to the source which produced the disease in his wife. That he could not have taken it from his wife, is evident from the eruption appearing in ten days from its first coming out on her; which is too short a period in the Natural Small-pox. Two weeks is I believe the shortest period of the Variolous eruption taking place in the natural way; this was exactly the case in a child of about three months old, whom

I vaccinated at the same time with this man, and who was constantly in the same room with him and his wife. The vaccination succeeded in the most perfect manner, yielding a plentiful supply of matter on the seventh, eighth and ninth days, at which time he seemed slightly indisposed, and apparently experienced pain in the axilla. This subsided by the eleventh or twelfth day, when a scab was forming. A new set of symptoms took place on the thirteenth, viz. a considerable degree of fever, &c. which continued till near the beginning of the sixteenth day; when three or four very perfect Variolous pustules appeared on the face, which matured rapidly, and were nearly dried up by the twentieth day.

It may perhaps be said that the man might have escaped the first exposure to the Variolous contagion, and have taken it from another source. This however is unlikely: I took considerable pains to find out if he had been exposed to any other source, but had every reason to believe he had not; I therefore felt perfectly assured that the first impression of the Vaccine upon the system, was to suspend the Variolous action then existing; but that it was incapable of destroying it, from its having got so greatly the start; hence its progress was resumed as soon as the constitutional symptoms of the Vaccine began to decline. I doubt not the Variolous contagion was *moderated* also in both the above cases, certain it is the maturation of the pustules was much more rapid than usual.*

It may not be uninteresting to remark of the last mentioned case, that about three weeks from the time the scabs were completely formed, I was told the child was

* How far the Vaccine has the power to suspend and prevent the Small-pox after the contagion has been received into the system, I cannot say. Certain it is that many persons do not take the Small-pox though exposed to its influence, and such accidental coincidences, may be thus ascribed to the Vaccine in many instances, when in fact the Vaccine had nothing to do with it.

broken out with a *second* attack of Small-pox. It was however only the Chicken-pox which he caught from a boy in the same house who had broken out about ten days before. He was slightly indisposed for a day or two preceding the eruption, which continued to come out three days, and then rapidly dried away. The fluid in these pustules continued *limpid* till the last, which is not the case in the Small-pox.

I have seen five cases of the union of the Small-pox and Vaccine, in three of which the febrile symptoms of the Small-pox occurred (and not very lightly) about the period of the constitutional symptoms of the Vaccine; and hence, I would wish again to enforce the caution I above mentioned, viz. not to consider the Vaccine as a preservative against the Small-pox before it has completed its action on the system; which probably is seldom before the ninth or tenth days. Before this period then, it is highly improper to run unnecessary risk by exposure to the Small-pox, or by inoculation; although I have no doubt that it will frequently prevent the disease, even after having been several days exposed to the contagion; of this Dr. Jenner gives some striking instances at p. 168, 169, of his invaluable Treatise, on the authority of Mr. Lyford, and his nephew the Rev'd. G. C. Jenner. In one instance two children escaped who had, previously to Vaccination, been exposed five days to the Variolous contagion from their father. In the other, a family of a man, woman, and five children, were vaccinated four days after being exposed to the constant action of the Variolous poison. It took effect *on all but* the mother, who consequently had the Small-pox. These cases are sufficient to prove my position; *but* will not warrant *unnecessary* exposure.

Several circumstances which have been mentioned seem to lead me to say a few words on the possibility of two diseases existing in the system together. As this involves one of the most favorite doctrines of the present day, I shall certainly be excused for collecting together several import-

ant facts on this head, from various sources. Theory can have but little ground in a dispute, where fact at last must determine the question.

I have already stated the cases which have come under my observation of the combination of Small-pox and Vaccine; not in succession, but at the same time, and without the least suspension of action. To this I may add that almost all the cases of Dr. Woodville, tend to prove the same. No reasonable doubt can I believe be entertained, that one disease at times will overpower, or suspend another, as in the instance related by the celebrated Mr. John Hunter, of the Measles and Small-pox, and on which he has founded this favorite hypothesis. It is very unfortunate that this fact, with others of the same nature, have been considered as so thoroughly establishing the position above mentioned, that a contrary opinion, though backed by facts from different sources, has been considered unworthy of investigation, and has even been treated with ridicule, as I have seen. This is more to be wondered at, because as merely a matter of fact, its truth might have readily been ascertained; and the arrival at that truth, I am satisfied is the great object of the researches, of the advocates of both opinions.

I shall not take up time at present by detailing the cases of combined Vaccine and Small-pox which have come under my notice. I shall present to the public, cases in point, from various authors, sufficient I apprehend to establish the position. As it would occupy unnecessarily a large portion of time to detail each case, I shall refer to the works where they are to be found.

Dr. Jenner, p. 137, gives an interesting case of coexistence of Measles and Cow-pox, where both diseases appear to have run their course without any sensible interruption, except a slight temporary suspension of the efflorescence, which had not appeared on the twelfth day, but advanced in the usual manner before the pustule scabbed. As there exists, however, so great a variety in the appearance

of the efflorescence, I am not disposed to consider this late period of its appearance as any way depending on the Measles; the constitutional symptoms of which must have subsided long before.

At p. 170. Dr. Jenner relates a very striking case of co-existing Vaccine and Scarlatina Anginosa, in a young lady. On the evening of the eighth day from Vaccination she was seized with symptoms denoting the accession of violent fever accompanied with sore throat. The next day the redness of the skin took place; it pursued its usual progress, as did also the Vaccine pustule without any deviation, except that, as in the last case the areola did not appear until the Scarlatina retired. The same reason may be urged against the opinion that the existence of the Scarlatina prevented the areola.

I cannot omit mentioning the case immediately following the one above, which is extremely interesting, as it proves the entire occasional suspension of one disease by another. The sister of the last mentioned case, who was exposed to the contagion of the Scarlatina at the same time, sickened almost at the same hour. The symptoms were severe about twelve hours, when the rash faintly appeared on the face and neck; in two or three hours *it suddenly disappeared*, leaving her free from complaint. The inoculated pustule had in this case the efflorescence surrounding it, which began on the fourth day to die away, and the pustule to dry up; when the Scarlatina again appeared, and spread all over her, accompanied with the sore throat and common symptoms of the disease.

Ring abounds in instances of the combination of diseases, either from his own authority or that of others.

At p. 107, on the authority of Mr. Leighton he mentions three cases of a co-existence of Small-pox, Measles and Hooping-cough. The same is stated as not unfrequent in the Marybone infirmary by Dr. Rowley, p. 267. At p. 108, he says he had within six months met with three cases of the co-existence of Cow-pox and Measles. Mr. G.

Jenner he adds, had lately met with a similar case; and in all these cases the periods of the respective eruptions varied; in one the Measles appeared on the second day, in the second on the eighth, in the third on the fourth, and in the fourth on the eighth; but in neither instance interrupting the progress of the Vaccine. In these also *the Arcola was perfect*. A case of Cow-pox and Chicken-pox, occurred to Mr. Little of Plymouth, (see Ring p. 109), the latter appearing on the tenth day of Vaccination, when the pustule had arrived at its height of inflammation.

At p. 267, he mentions a patient of Mr. Sandy's in whom the Measles and Small-pox appeared on the *same day*, and both eruptions went on together.

At p. 268 he mentions several cases of the co-existence of Cow-pox and Small-pox; the latter disease appearing the third, sixth, seventh and eleventh days. Various other cases are enumerated.

A gentleman in this city gave me an account of the Vaccine and Itch combined.

The following account of co-existence of Small-pox and Measles, by Dr. Patrick Russel, is taken from the Medical and Physical Journal of July 1800. The facts are powerful stumbling blocks to the opposite opinion.

These cases occurred at Aleppo in 1765. The following is the history in the Doctor's words.

"In the month of March, an instance occurred where both diseases were conjoined in the same patient. The subject was a female child two years old, of a pale delicate complexion. The redness of the eyes, the coryza, and the cough which accompanied the fever, led me to expect the Measles. On the fourth day, the eruptions of the Measles were visible on the face, the neck, and the back; but at the *same time* a few eruptions of a different kind were interspersed on the face and neck, which if they had been the sole eruption, I should without hesitation have declared to be the Small-pox. The progress of the pustules on the fifth proved them to be Variolous. Both eruptions

were of a favorable kind, and *distinctly pursued* their regular course. On the eighth day, the Measles were fading fast, while the Variolous pustules on the face were near their height. The pustules were not numerous, were very distinct, and ripened perfectly. The cough continued to be a troublesome symptom, especially in the second week. A diarrhœa supervened about the fourteenth day, and contributed to render the child's recovery very slow.

“ In the month of April I met with a similar case. A healthy boy, three years old, was attacked with the usual symptoms of the eruptive fevers, at that time epidemical. The cough rather seemed to indicate the Measles. On the third day, the eruptions of the Small-pox and Measles made their appearance together. The Variolous pustules were of the small round kind, and came to perfect maturity, but were more numerous than in the former case. The Measles were of a fainter colour, and left behind them still less of the branny scurf, agreeing in both circumstances with the disease then prevalent.” See Med. and Phys. Jour. p. 71.

In p. 29, 30, of the Medical and Physical Journal is also a case of the co-existence of Measles and Small-pox, though by no means so strong as the above. On the ninth day several pustules around the inoculated part were advancing to suppuration, on the eleventh some appeared on the body, accompanied with fever; on the thirteenth day, whilst the pock were still advancing, an eruption exactly resembling the Measles, accompanied with the symptoms of discharge from the eyes, &c. made its appearance. The two diseases progressed together till the fifteenth, when the Measles began to disappear, and were nearly gone by the seventeenth, at which time the Variolous pustules were also drying away.

A combination of the same diseases is mentioned in two instances, in the third volume of the New-York Medical Repository, by Dr. Tracy, and ought not to be overlooked: I must refer the reader to the work adverted to, for a full detail of these interesting cases.

The following letter from Dr. B. F. Young, of Northumberland, to me, among other interesting information mentions a case of co-existing Vaccine and Measles, besides several cases of what I consider as a co-existence of the Vaccine and Small-pox.

“ Northumberland, February 27, 1802.

“ DEAR SIR,

“ I have delayed thanking you for your letter and the two portions of virus you were so good as to send me some time since, in order to communicate more fully the result of many trials I made with it. The first portion on glass arrived the same evening with an armed lancet from Dr. James; this lancet was dipped in luke warm water and applied to the glass in such a way as to mix them perfectly.* I then vaccinated five children, all perfectly well and free from every kind of complaint. Four of the five succeeded; my own son had the complaint agreeable to Aiken in every particular, and the different changes all took place within an hour or two of the time mentioned by him; consequently he had it very favourably. The second took sick on the ninth day, which excited my particular attention; the fever increased for three days, and terminated on the fourth, in a most plentiful eruption, so exactly resembling the Small-pox, that I was apprehensive it laboured under a pre-disposition to that disease at the time I put the virus in its arm; their pustules all filled, and are not yet entirely dried away; the third child sickened on the eleventh day; pulse in the morning of the twelfth day 184, at eleven o'clock this morning it had a fit, in which the parents declare it lay half an hour; the thirteenth, fourteenth, and fifteenth days, fever as high as possible, attended with convulsions every two or three hours; in the evening of the fif-

* The matter sent by me was taken from case 21 on the ninth day, and was then forty-one days old. It had been secured between glass and coated with gold-beater's skin.

teenth day completely eruptive all over the body; these pustules as they filled became confluent, so as to cover the body in one incrustation, not yet entirely dried away. The fourth child sickened on the fourteenth day, had one severe convulsion the night of the fifteenth, and a moderate eruption the seventeenth day, which filled regularly, and has dried away.

“ From the above account it will appear, that I have been more unfortunate than perhaps most persons who have been in the practice of vaccinating; nor can I assign any reasonable cause for three out of four proving pustular: had I been less particular in the choice of my patients, or in making the puncture or rather scratch in the arm, or the lancet made use of, I should have felt unpleasant upon the occasion; but as it is, I am satisfied that it is an unusual variety of the disease, and that they must occur much oftener than is generally supposed. Each of the arms wanted the inflamed margin until after the fever, and the edges were never well defined. With matter taken from all four of the children on the seventh, eighth, and ninth days, I vaccinated thirty-one, three out of which number proved moderately pustular, not much fever attended either, and no convulsions; arms generally inflamed on the eleventh day. Indeed I now confidently predict an eruptive Vaccine if the efflorescence does not appear on or before the twelfth day. In one case it was completely formed on the seventh day, owing to the child's sickening with the measles on the third day, and the eruption taking place on the seventh; on the eleventh and twelfth day it disappeared entirely.

“ I shall continue the practice in preference to the Small-pox, being perfectly satisfied, notwithstanding my having been so unfortunate in the onset, that it is a much safer and milder disease than the other; and that the number of unpleasant cases will continue to decrease with me.”

To this I returned the following answer.

" *Philadelphia, March 3, 1802.*

" DEAR SIR,

" Your interesting letter of the twenty-seventh came safe to hand this morning, and has greatly surprised me: Of this you will be convinced when I assure you, that of fifty cases of Vaccine which have come under my care, I have met with only *two*, in which any other pustule but that on the vaccinated part took place. In these, besides the local pock, *one* other appeared in each, the particulars of which I shall give in a publication I am slowly preparing for the press.

" I am however clearly of opinion that the Variolous infection has in some way crept in among the cases you mention. My opinion is formed on the following reasons. Your son having the disease so favourably, whilst the remaining four suffered so considerably, though vaccinated with the *same* infection, seems a strong argument for supposing their previous exposure to the Small-pox. The exact resemblance of the eruption to the Small-pox, and its confluence in one instance accompanied also with alarming convulsions, are other difficulties to be removed before I can believe it was the Vaccine. The fourth child sickening on the fourteenth day, or about the period for the Natural Small-pox; the absence of the *well defined* edges of the Vaccine pock; which I suspect was not the case in your own child, and the almost total absence of pustules in the second set of cases you enumerate.

" I could have wished you had noticed the peculiar appearance of the local pock, as compared with the general eruption, and also the appearance of the contents of the pustules themselves. Did they become *purulent*, or did they contain a *limpid* fluid to the last? An accurate account of each case with any observations which may have since occurred to you will be highly acceptable. Did you inoculate the second set with matter taken from the local pock, or from the general eruption? Has not the Small-pox been any where in your neighbourhood, which might reasonably account

for its occurrence in four of your patients; whilst your son from his youth might not be exposed to the danger?

“The matter which both Dr. James and I sent you, was taken from patients who had the Vaccine in the most favorable manner. I can therefore in no way account for the eruption but by supposing the *co-existence* of the Vaccine and Small-pox, of which I have met with several instances; and of which Dr. Woodville has a still more considerable example, in the first cases of the Vaccine which came under his notice in the Small-pox hospital.

“Your case of Vaccine and Measles combined is very interesting; I will thank you for the detail. I am collecting the various facts of this description which I shall bring forward in the publication above alluded to. They appear to be so numerous, that the advocates for the celebrated J. Hunter’s opinion of the impossibility of two diseases co-existing, will I imagine find it difficult to explain them away. I have no doubt that one disease is more frequently suspended by another, as was the case, in the instance adduced by Hunter; but these certainly are not conclusive, &c. &c.

“In the mean time, I am

“My dear Sir,

“Your obedient Servant,

“JOHN REDMAN COXE.”

The following is extracted from a letter in answer to mine, dated May 5th.

“Since my last communication, I have vaccinated upwards of a hundred, and have had but one eruptive case, and that very slight. The matter with which I inoculated the second set of patients (thirty-five in number, two of which proved pustular), was taken from the pustule at the puncture on the ninth day. I began with my child, and added to the general stock upon the point of the same lancet from each of the others as I visited them; the black boy I mentioned as being concerned in nursing —’s child, (the case of violent convulsions), sickened on

the twenty-first day after I wrote to you; this proved to be the true Small-pox, although he had it very favourably; a little girl in a neighbouring house also had it.

“ This last circumstance has served to satisfy my mind, that the first cases must have been Variolous, although I cannot account for the manner in which it was communicated.

“ The Small-pox was not within twenty-five or thirty miles of this town at the time of my inoculating them; and the parents of each, upon being questioned as to the probability of an infected person visiting the family, declare they do not think it possible; the professions of the family, being very different, it can scarcely be supposed that the same person could have had business with all of them.

“ I have not attempted to inoculate with Variolous matter, but shall soon make trial of it.

“ I never ventured to try the effects of matter taken from a pustule upon any part of the body, but the inoculated part.

“ With much respect,

“ I am dear Sir,

“ Your's sincerely,

“ B. F. YOUNG.”

“ P. S. *I have had upwards of thirty cases of Measles and Vaccine at the same time, and in two instances the hooping-cough.*”

If now we allow that credit to the above cases to which they appear entitled, we must I think coincide in opinion that two diseases may exist together in the system.* Why

* Mr. Ring says, p. 110, “ He (Dr. Jenner) also limits the axiom of Mr. Hunter to the incompatibility of two diseased actions in one and the *same part*. Mr. Hunter's axiom however was more general, in whatever manner it may have been expressed on any particular occasion. The prevailing hypothesis, that two cutaneous diseases cannot make their appearance at the same time, but that one will always suspend the other, is continually quoted in the Medical Schools and So-

at one time this should be the case, and at another, one disease should suspend the other, is a curious subject of investigation.* I shall now take leave of this part of my enquiry, and proceed to say something of the *Spurious Disease*.

I have already observed that genuine matter will sometimes produce a spurious disease from some peculiarity of constitution. I have in the tables mentioned a case of this kind, in which five successive attempts either failed or produced the spurious disease. (See case 35).† The sixth attempt was apparently more successful, for although it got considerably rubbed, it still retained the circumscribed appearance of the true disease. I have not yet tried the Variolous infection; A troublesome itching constantly accompanied the spurious disease, and the constitutional symptoms occasionally ran high. Dr. Jenner supposes, and I think with much

cieties, as maintained by Mr. Hunter; and Mr. Home himself lately informed me, that Mr. Hunter was of opinion, two cutaneous diseases could not take place at the same time in the same person.

“By a reference to the cases of co-existence before enumerated, (Dr. Woodville’s cases) it will be found, that in some of them, not only the patients laboured under two eruptive diseases at the same time; but that the eruption was even synchronous.

“But what proof have we, that even the limited action of Mr. Hunter is founded on the basis of truth? Why are two morbid actions more incompatible than two healthy actions? That two, or more, healthy actions in the stomach may co-exist, will not, I apprehend, be denied. When the peristaltic motion takes place, by muscular action, surely no one will maintain, that the action of the nervous or arterial system must necessarily be suspended.”

* I shall mention concisely the diseases which appear to have been combined, 1st. Measles and Small-pox. 2d. Measles and Vaccine. 3d. Vaccine and Small-pox. 4th. Vaccine and Scarlatina. 5th. Vaccine and Chicken-pox. 6th. Vaccine and Itch. 7th. Small-pox, Measles and Hooping-cough.

† By a reference to my own case, (No. 1) it will be perceived that with recent virus taken from a perfect pustule on the seventh day, I

reason, that these anomalous appearances, sometimes owe their origin to the friction of the clothes on the newly inflamed part of the arm, and he has at p. 175 given a case, in which the punctured part was on the sixth day encrusted with a rugged amber coloured scab, instead of shewing a beginning vesicle. The scab spread and increased in thickness for some days, when a *vesicated ring* appeared at the edges. From the fluid matter five persons were inoculated. In one of which it produced a perfect pustule; whilst in three of the others a creeping scab of a loose texture was produced, followed by the formation of a limpid fluid at its edges as in the case from which the matter was taken. In these instances the Vaccine disposition apparently lay dormant, though the vesicated ring proves that it was at length excited to action. I presume, matter taken from those cases before the formation of the vesicated ring, would have inevitably induced a spurious disease.

The spurious Cow-pox may be induced by inoculating with matter taken from a cow, who has not the true disease. Attention to the characteristic marks of the true disease as laid down by Dr. Jenner § will prevent this source of error. time had nearly prevented the introduction of this valuable

produced a perfect disease in a child of one year old; whereas with matter taken the next (or eighth) day of the disease, when its appearance was still more beautiful and its size augmented, I induced a spurious pustule on my own hand, which was from the beginning attended with an intolerable itching; a light areola of nearly three-fourths of an inch diameter occurred on the fourth day, accompanied with a hard base. On the fifth a fluid of a purulent nature gave the pustule more of a Variolous appearance and by the seventh day a scab was forming; the whole was nearly gone by the twelfth. Here was a pustule differing from those I had formerly experienced in my own person, as light from darkness; it wanted the flat surface and depressed centre and was unaccompanied with any febrile indisposition or axillary affection which existed in the perfect disease,

§ Treatise on the Variolæ Vaccinæ, p. 78.

Matter possessing the specific virus, originally, may by suffering a decomposition, from too great heat, from putrefaction, or from any other cause, prove a source of the spurious disease.* Matter may be taken at too late a period from the true pustule when it has totally lost its specific property. On all these heads, I must refer to Dr. Jenner p. 72 *et seq.* and shall here content myself, with giving a valuable and concise view of the genuine and spurious pustule, in Dr. Jenner's "Instructions for Vaccine Inoculation," which I lately received from England, and which have already been published in the news-papers.

" INSTRUCTIONS FOR

" *VACCINE INOCULATION.*

" LET the Vaccine fluid be taken, for the purpose of inoculation, from a pustule that is making its progress regularly, and which possesses the true Vaccine character, on any day from the fifth to the eighth, or even a day or two later, provided the efflorescence be not then formed around it. When the efflorescence is formed, it is always most prudent to desist from taking any more of the virus from that pustule.

" To obtain the virus, let the edges of the pustule be gently punctured with a lancet in several points. It will gradually ooze out, and should be inserted upon the arm about midway between the shoulder and the elbow, either by means of a very slight scratch, not exceeding the eighth part of an inch, or a very small oblique puncture.

* See the letters in the Appendix, relative to the spurious disease in New York, Norfolk, &c. From what cause the matter employed in these places, lost its characteristic property, is impossible to say. I hope the introduction of these letters will serve as beacons to prevent similar misfortunes elsewhere, by inducing Practitioners to acquaint themselves minutely with the character of the genuine Vaccine pock.

“ A little red spot will appear on the punctured part on the third day, if the operation succeed, which on the fourth or fifth becomes perceptibly vesicated. It goes on increasing till the tenth day, when it is generally surrounded by a rose-coloured efflorescence, which remains nearly stationary for a day or two. The efflorescence then fades away, and the pustule is gradually converted into a hard glossy scab, of a dark mahogany colour. These progressive stages of the pustule are commonly completed in sixteen or seventeen days.

“ A single pustule is sufficient to secure the constitution from the Small-pox; but as we are not always certain the puncture may take effect, it will be prudent to inoculate in both arms, or to make two punctures in the same arm, about an inch and a half asunder, except in very early infancy, when there is a great susceptibility of local irritation.

“ If the efflorescence surrounding the pustule should be extensive, and occasion much local heat upon the arm, it may be cooled by the repeated application of pieces of folded linen dipped in cold water; or still more expeditiously by a strong solution of the *aqua lythargyri acetati** in water; an ounce, for example, of the former in five or six of the latter.

“ If the scab should at any time be prematurely rubbed off, the part may be occasionally touched with the undiluted *aqua lythargyri acetati*.

“ Vaccine virus, taken from a pustule, and inserted immediately in its fluid state, is preferable to that which has been previously dried; but as it is not always practicable to obtain it in this state, we are compelled to seek for some mode of preserving it. Various means have been suggested, but from the test of long experience it may be asserted, that preserving it between two plates of glass is the most eligible. Let a piece of common window-glass be cut into squares of about an inch each, so that they shall lie smooth

* Goulard's extract of Saturn.

when placed upon each other. Let the collected Vaccine fluid be confined to a small spot (about the size of a split pea), upon the centre of one of these glasses; which should be suffered to dry in the common heat of the atmosphere, without exposure to the heat of fire or the sun. When dry, it should be immediately secured by placing over it the other piece of glass. Nothing more is necessary for its preservation than wrapping it in clean writing paper.

“ The virus, thus preserved, when wanted for the purpose of inoculation, may easily be restored to its fluid state by dissolving it in a small portion of cold water, taken up on the point of a lancet. It may then be used in the same manner as when just taken from a pustule.

“ The Vaccine fluid is liable, from causes apparently trifling, to undergo a decomposition. In this state it sometimes produces what has been denominated the spurious pustule; that is, a pustule, or an appearance on the arm not possessing the characteristic marks of the genuine pustule. Anomalies, assuming different forms, may be excited, according to the qualities of the virus applied, or the state of the person inoculated; but by far the most frequent variety, or deviation from the perfect pustule, is that which arrives at maturity, and finishes its progress much within the time limited by the true. Its commencement is marked by a troublesome itching; and it throws out a premature efflorescence, sometimes extensive, but seldom circumscribed, or of so vivid a tint as that which surrounds the pustule completely organized; and (which is more characteristic of its degeneracy than the other symptoms) it appears more like a common festering produced by a thorn, or any other small extraneous body sticking in the skin, than a pustule excited by the Vaccine virus. It is generally of a straw colour; and when punctured, instead of that colourless, transparent fluid of the perfect pustule, its contents are found to be opaque. That deviation from the common character of the pustule, arising from Vaccine virus which has been previously exposed to a degree of heat capable of decomposing

it, is very different. In this instance, it begins with a creeping scab, of a pale brown or amber colour; making a long and slow progress, and sometimes going through its course without any perceptible efflorescence. Its edges are commonly elevated, and afford, on being punctured, a limpid fluid.

“A little practice in Vaccine inoculation, attentively conducted, impresses on the mind the perfect character of the Vaccine pustule; therefore, when a deviation arises, of whatever kind it may be, common prudence points out the necessity of re-inoculation, first, with Vaccine virus of the most active kind, and secondly, should this be ineffectual, with Variolous virus. But if the constitution shews an insusceptibility of one, it commonly does of the other.

“When any constitutional symptoms occur in inoculated Cow-pox, they are commonly first perceptible (especially in children) on the fourth or fifth day. They appear again, and sometimes in adults, not unlike a mild attack from inoculated Small-pox, on the eighth, ninth, or tenth day. The former arise from the general effects of the virus on the habit, the latter from the irritation of the pustule.

“If the effluvia of the Small-pox have been received into the habit previously to the inoculation of the Vaccine virus, the Vaccine inoculation will not always be found to stop its progress, although the pustule may make its advances without interruption.

“The lancet used for inoculation should always be perfectly clean. After each puncture, it is proper to dip it into water, and wipe it dry.

“The preservation of Vaccine virus upon a lancet, beyond the period of a few days, should never be attempted; as it is so apt to produce rust, which will decompose it.

“EDWARD JENNER.”

Inattention to the distinction between the true and spurious Cow-pox has produced much confusion, and for a

disease. Time has however unfolded more accurately this difference; and I feel persuaded, no doubt can arise in the mind of one who has seen the regular progress of this beautiful pustule: Wherever this regularity is deficient, prudence I think would induce another trial. The Small-pox is doubtless capable in like manner of producing a spurious disease: it is in this manner I would account for persons who have taken the disease in a natural way, after supposing themselves secured, in consequence of a violent degree of fever accompanying the sore arm produced by inoculation. An eschar may be produced by any sore which can destroy the cutis; this therefore though supposed so by many is not a criterion of the genuine nature of the previous Small-pox.

But after all I have said, I have no doubt that occasionally, instances do occur of a second attack of Small-pox, not merely local, or even accompanied by general irritation of the system as the effect of the local affection; but of an absolute second attack. Why a person should (generally) escape a second attack of this and other contagious diseases, even though he should arrive to the great age of one hundred years, is a circumstance, of which we are likely always to remain in ignorance. In that long period we might reasonably imagine a total renovation of every part of the body, by absorption, &c. yet the disposition impressed by a first attack, still exists; which whilst it manifests the Power, exhibits also strongly, the Benevolence of the GREAT AUTHOR of our existence.

In proof of the certainty of a second attack of Small-pox, I beg leave to offer the following cases.

At p. 58, Mr. Ring says, "One case where the Small-pox occurred a second time, I lately shewed to Dr. Jenner and Mr. Simpson. It was brought to me by my friend Mr. Leighton. To those who know that gentleman, his own opinion is sufficient; but if any other can be deemed necessary, it was the opinion of all who saw the case, that it was undoubtedly the Small-pox,

"The number of pustules amounted to some hundreds. Yet the patient had been inoculated by Mr. Leighton three years before; and had a proper inflammation and pustule on the arm, together with a small eruption."

Dr. Jenner at p. 118, on the authority of Mr. Fewster, gives a pretty remarkable case, of a child of fourteen months being inoculated for the Small-pox, which took effect very favorably. The nurse twenty-four years of age, many years before had the natural Small-pox, and was much pitted. She had accustomed the child to sleep on her left arm, with her left cheek in contact with his face, in which manner he mostly slept during inoculation. About a week after the child was well, a plentiful eruption broke out on the left Cheek of the nurse, *but not on any other part of the body*, and went on to maturation. Three days preceding the eruption she had slight chilly fits, head-ach, pain of limbs, and some fever. The pains went off, on the eruption taking place, and on the fifth day, Mr. Fewster inoculated two children from these pustules, producing a plentiful eruption*.

The circumstance of the fever *preceding* the eruption seems to indicate something more than a mere local disease. I shall however in the concise manner of Dr. Jenner, transcribe the case of Mr. Richard Langford, recorded by Mr. Edward Withers in the fourth volume of the Memoirs of the Medical Society of London, to which I must refer whoever wishes more extensive information of the case.

"Mr. Richard Langford, a farmer of West Shefford, in this county, (Berks), about fifty years of age, when about a month old, had the Small-pox at a time when three others of the family had the same disease, one of whom, a servant man, died of it. Mr. Langford's countenance was strongly

* This fever, &c. it is evident, was not owing to the irritation arising from the pustules, as they had not then appeared. It was therefore certainly the constitutional effect arising from the primary action of the Variolous poison,

indicative of the malignity of the distemper, his face being so remarkably pitted and seamed, as to attract the notice of all who saw him, so that no one could entertain a doubt of his having had that disease in a most inveterate manner." Mr. Withers proceeds to state "that Mr. Langford was seized a second time, had a bad confluent Small-pox, and *died* on the twenty-first day from the seizure; and that four of the family, as also a sister of the patient's, to whom the disease was conveyed by her son's visiting his uncle, falling down with the Small-pox, fully satisfied the country with regard to the nature of the disease. The sister died. The case was thought so extraordinary as to induce the Rector to have it recorded in the parish register."

At p. 178, Dr. Jenner gives us a letter from Mr. Thomas Miles, relating his own case, as exemplifying the opinion of the frequent susceptibility of the system to the Variolous contagion, although it has previously felt its influence. This gentleman being solicitous to shew the mode of communicating the disease by inoculation to a mother whose child was about to undergo the operation, introduced his lancet in the usual way on his own hand, and thought no more of it till a sensation in the part on the third day, reminded him of it. It proceeded regularly, and the pock gradually filled with a fluid, without giving him any uneasiness, supposing a mere local affection would be the whole he should experience. In this however he was mistaken, "for on the eighth day," he adds, "I was seized with all the symptoms of the eruptive fever, but in a much more violent degree than when I was before inoculated, which was eighteen years previous to this, when I had a considerable number of pustules. I must confess I was now greatly alarmed, although I had been much engaged in the Small-pox, having at different times inoculated not less than two thousand persons. I was convinced my present indisposition proceeded from the in-

section of the Variolous matter, and therefore anxiously looked for an eruption. On the tenth day I felt a very unpleasant sensation of stiffness and heat on each side of my face near my ears, and the fever began to decline. The affection in my face soon terminated in three or four pustules, attended with inflammation, but which did not mature, and I was presently well."

To these very strong cases I shall make no apology for adding an interesting extract of a letter, dated June 15th, 1799, from Dr. Henry Arnott, of Hopewell Township, York County, Pennsylvania, to Dr. Rush, and which he has politely furnished me with.

"In your Treatise on Inoculation for the Small-pox you alledge, that there are certainly cases where there are the most irrefragable proofs of the infection implanted by inoculation being of a Variolous nature, where the disorder has been afterwards taken in the natural way; in these cases, you suppose the Variolous matter produced only a topical or cuticular disorder, and that a fever and eruption seem necessary for producing some impression on the whole system, in order to render it ever after incapable of receiving an impression of a similar nature. Of the truth of this I was fully persuaded till last summer in the month of July, when (unhappily for me) some cases occurred, which I confess stagger me a good deal, and have exposed me to a very great deal of country clamour. Permit me Sir, to lay the cases before you. About four years ago, I inoculated a young woman for the Small-pox; on the third day the orifice seemed a little inflamed, the inflammation however went off, till about the ninth day, when it began to rise up in form of a pustule, at which time the girl sickened, and the fever continued four days, attended with the ordinary symptoms: about the evening of the fourth day, some pimples made their appearance here and there in different parts of the body, which remained until the seventh day; some

of them filled with Variolous matter and did not disappear till the ninth or tenth day; they left marks behind them which are still visible. From these circumstances, I was assured she had the Small-pox, and confidently told her so. Since, about the 20th of March 1798, the Small-pox has been epidemical in this part of the country, and in July following, she was called to-nurse a family who had them of the confluent kind in the natural way: she had scratched a bit of skin off the little finger of her left hand, and being constantly employed in opening the pustules, moving the patients from one part to another, washing dirty clothes, &c. &c. it grew up in the form of a large pustule, and in the course of nine days, she was attacked with the eruptive fever, which continued with considerable violence for four days, at which time, the Small-pox made their appearance to the amount of five hundred, the most of which filled with good matter, and continued so till the ninth day, when they formed into scabs, and then disappeared.

“ Another girl was attacked with the fever, which continued the usual length of time, attended with the common symptoms, after which, three pimples made their appearance, and then disappeared about the ninth day.

“ Another girl in the same house seemed to have been infected by her; she was seized with a fever, which produced several pustules: the first of these girls being satisfied she had had the Small-pox, exposed herself to the contagion, was infected a second time, and attacked with the confluent Small-pox, of which she recovered with great difficulty: upon the back of which, the other girl was attacked with the same disorder, which carried her off about the fourteenth day. A gentleman in this neighbourhood employed me to inoculate his children, seven in number; previous to which, he had got a servant girl from Baltimore, who had been inoculated before she came to the country; the mark of the orifice in her arm was perfectly visible, and she affirmed she had gone through all the different stages of the

disorder: however about the time that the children were in a blackening state, she took the Small-pox, but got over pretty easily

“Such cases are certainly distressing both to families and Practitioners: from these cases however, which I know to be incontestible facts, I am really inclined to think, that a person is liable to be attacked with the Small-pox more than once in his life.”

To these cases many Practitioners will doubtless be able to add others. They certainly are very extraordinary, and may serve to moderate the clamour of some, who consider the Vaccine, as either only acting as a *temporary* preventive, or as by no means universally infallible. The first of these opinions seems sufficiently confuted, (see p. 67); and should the last be found true, (which of many hundred thousands has not yet been the case), it will still be in this respect, on an equality with the Small-pox.

The great advantage of this extraordinary disease, is evidently its prophylactic power against the Small-pox. But its benefits to mankind do not cease here. Its efficacy in the removal of sundry diseases of a chronic nature, and which had baffled a variety of medical applications, seems established by numerous testimonies. Although experience has proved it to have worked a cure in several instances, it is not to be supposed it always will be equally effectual: but assuredly it deserves a trial in similar instances which do not readily yield to the power of medicine. Its mildness will always be a pledge of its security; and no harm can possibly arise, even though no positive good should ensue.

Many Practitioners have assured us of its beneficial influence on weakly constitutions, in repeated instances. It is however not uncommon to see a weakly constitution, amended by any disease which affects the system generally; hence even the Small-pox will occasionally prove beneficial. I

can add with much propriety on this point, the observation of a parent to me after his child had passed through the disease; that it was not a disease for poor people; in allusion to the appetite which seemed to have rapidly increased.

It appears from the observations of Dr. Jenner and others, that the Vaccine besides frequently benefitting weakly constitutions, has actually corrected a scrofulous diathesis existing in the constitution. Dr. Cappe says he has seen "one of his patients recover from sore eyes, and eruptions on the skin; and three others from eruptions on the skin, while under inoculation of that disease." Ring, p. 370.

Mr. Simpson's letter to Mr. Ring contains a most valuable testimony in its favor; "Mr. G——'s child had a very obstinate eruption of the crusta-lactea kind; but more violent than it is commonly met with. It covered the head and face, and the greater part of the body. It withstood the effects of the usual remedies; and the little creature was really disgusting to look at. The time arrived, at which the parents usually had their children inoculated. I advised the Cow-pock; to which they at first objected, from a fear of aggravating the disease; but they afterwards consented, when I assured them that such an event was not probable, and that it was not impossible it might remove it.

"The child was inoculated with Cow-pox matter; and it was extremely gratifying to me to observe, that as soon as the constitution was evidently affected, the disease of the skin began to disappear; so that by the time when the Vaccine action subsided, the whole of the eruption had peeled off, in the form of very fine scales; or was brushed off, like powder. Not a particle of medicine was given; nor any external application used. I have the pleasure to say, there has been no return of the complaint, although *ten* months have elapsed.

"Several instances have occurred to me, in which the general health of weakly children has been very much improved." Ring, p. 736.

Doctor Husson in his valuable treatise, entitled "*Recherches historiques et médicales sur la Vaccine*," has collected together a number of striking instances of its efficacy in regard to health, as mentioned by different persons, and two strong cases which came under his own observation. One was a case of *violent head-ach* of three years standing, attacking the patient every three or four days, and which had baffled every effort. The Vaccine pustule was accompanied with a very extensive erysipelas, &c. The child at the expiration of five months had had no return of the head ach. The other was a case of *scrofula, cough, and shortness of breath*. As soon as the pustules began to appear, the cough became less frequent, the complexion improved, the glands of the neck diminished; and at the time of his writing he speaks of the child as being quite well. See p. 51 *et seq.*

Dr. Moreau, in his "*Historical and Practical Treatise on Vaccine Inoculation*," has given us a case of *scrofulous ophthalmia* cured by the Vaccine. In another instance the discharge from a fistula in the neighbourhood of the elbow, was lessened. The latter patient was inoculated *on a surface covered with an herpetic eruption*. Others were inoculated with the virus produced from this scrofulous and herpetic subject, *without injury*. See Ring, p. 792.

Mr. Ring, p. 799, says he has seen a letter from the Count de la Roque, stating, that he has received information of the Cow-pock being a corrector of some other disorders. He mentions a severe epidemic hooping-cough, which they who had undergone Vaccination, either escaped altogether, or had it mildly. This I suspect to be only an accidental coincidence. Mr. Fournier, first surgeon to the Military hospitals at Brussels, in a treatise on this disease, gives the following fact, which was certified by citizen Lebroussart, Professor of ancient languages in the Central School. "One of his children, four years of age, was a

long time affected with deafness, which grew worse and worse. Two months ago he was inoculated with the Cow-pock. On the ninth or tenth day, when the arm inflamed, the deafness began to diminish, and on the twenty-first it entirely ceased." See Ring, p. 855.

Mr. Ring further states from a communication of Mr. Garsed, that an infant four months old had been troubled with a violent cough about three months, which did not yield to medicine. The fifth day after Vaccination the cough suddenly left her, and did not again return. Mr. Garsed also informed Mr. Ring, that Messrs. Jones and Powell of Neath, mentioned to him "that a boy sixteen months old, full of scrofulous tumours, was brought to them for assistance:" they supposed it could not live a year. The mother laboured under the disease and had lost a child by it; she died also herself shortly after, from the vast discharge of different scrofulous abscesses. The child having never had the Small-pox, was vaccinated on the twenty-third March 1801, the disease running its course in the most favourable way. At this time he had several abscesses about the arms, neck and shoulders, which soon began to heal, and the child enjoys perfect health. All which was attributed to the Cow-pock. See Ring, p. 856.

I have met with one case, in which for ten days or two weeks preceding Vaccination, a disagreeable eruption had appeared on the arms and face, attended with great itching. About the time the areola began its progress, this declined, and by the fourteenth or fifteenth day was nearly gone. Whether it would not have gone of itself, I cannot pretend to say.

A remarkable case occurred also at Burlington, to Dr. Shippen, in a young lady *who had had the Small-pox in early life*, and was troubled with a disagreeable eruption, (which did not yield to medicine) on her face. She submitted to Vaccination and had it very finely and perfectly:

The disease however declined, and she still I believe continues free from it:*

In addition to these cases, I shall add the following, given me by Mr. John Vaughan, and which was procured from the parent of the child. "Samuel Swift son of Edward Swift of Bustletown, Philadelphia County, born January 3d, 1801, three weeks after birth was attacked with a violent eruption, chiefly of the cheeks, forehead, and chin, which baffled all medical applications. About January 20th, 1802, he was vaccinated by Dr. Worthington, a chief reason for which was to try the efficacy of the case in the above complaint. The face was worse than ever at the time the Vaccine was at its height. As the arm healed, the face grew better, and he now continues well; at times in cool weather, a little redness but no eruption has been perceptible."

I might go on to accumulate cases, but I apprehend these are sufficient to awaken attention on this point; and surely the subject deserves it. By Females it certainly deserves to be tried, since in many instances, the most pernicious applications are employed without effect, to remove those eruptions which frequently take place on the face and neck. It is to be observed I speak only of such *chronic* cases, which have baffled every application. In those only would I wish to recommend it. Experience however will daily augment our knowledge on this point, and I sincerely hope its truth may be confirmed.

It will not be improper here to give a comparative view of the superiority of the Vaccine over the Small-pox, in order to confirm the friends of this disease in their estimation of it, and in hopes to awaken conviction in the minds of its opponents.

* I was in hopes to have had it in my power to detail this case; I wrote to Dr. S. for the particulars, but have not yet received an answer. I have met with a case of almost constant head-ach since birth, which I vaccinated a short time past, since which there has been no return. Time must determine if the effect is permanent.

COMPARATIVE VIEW OF THE
VACCINE and SMALL-POX.

Small-pox.

First. This disease is in the highest degree contagious: hence those who never have had it, cannot without extreme hazard, mix with such as labour under it.

Second. The eruptive fever of the Small-pox is not unfrequently attended by convulsions of the most alarming nature, the effects of which are often felt through life; This is even often the case when the subsequent eruption is comparatively small.

Third. The numerous pustules produced by this disease in many instances, in opposition to every attention, whilst they exhibit by their temporary presence, a sight of the most horrid kind; are not less to be dreaded from their frequent disfiguration of their unfortunate victim, by the pits they leave behind.

Fourth. That attention to diet and to medicine, which is often necessary in guarding against the violence of this terrible disorder, is a frequent source of evil, as hundreds of mothers can testify.

Vaccine.

As this disease is not contagious, the separation of the well from those who are under its influence is entirely needless.

None of these dire effects are to be dreaded in the mild process of Vaccination.

An eruption in this disease is so rare an occurrence as never to be expected: And where it does exist, the number is so small, as to render it of little moment.

There seems to be scarcely an instance in which either regimen or physic would be requisite in the Vaccine.

Small-pox.

Fifth. The season must be attended to in inoculating for the Small-pox; as well as the age and present condition of the system; hence pregnancy and teething are invincible barriers against inoculation.

Sixth. The frequent, and often long continued nursing; the extreme anxiety which all parents must feel, although every precaution be made use of, because the issue of the disease is at all events precarious, must forcibly contrast the two diseases.

Seventh. The Small-pox, it is agreed, often calls into existence the dormant germs of disease, or so alters the constitution of the patient, that it more readily receives such impressions, as dispose to various diseases, as scrofula, white swellings, consumption, ophthalmia, blindness, and many more.

Vaccine.

One season is scarcely preferable to another in this mild disease: Age and existing circumstances are of little moment; hence teething and pregnancy are no objections to its use.

Nursing, anxiety and death are almost equally strangers to the Vaccine. Death, we may confidently affirm, has *never* employed the Vaccine as a besom of destruction.

As much as we know of the Vaccine, we find it efficacious in frequently removing many formidable complaints, and in benefitting a weakly constitution.

The comparison might probably be considerably extended: enough is said however, to shew the vast superiority of the Vaccine over Variolous inoculation.

I cannot bring this treatise to a conclusion without remarking, that as it is of infinite consequence to mankind, to determine accurately, if the Vaccine originates in the Grease

of the horse, I hope it will induce persons who have leisure and opportunity to attend to such investigations, to experiment fully on this important point. This is a work of greater facility in the country than in the town. I have in vain endeavoured for several weeks, to procure the matter of the Grease from the inns and livery stables of this city, and from other sources, where I thought I might be likely to obtain it. My wish was to inoculate a cow, and also to try to produce the specific disease on myself with it, and from this source to transplant it to another, in order to determine, whether the passage of this matter through the human system would not produce a disease perfectly similar in appearance and effects. It appears probable from the eighteenth case mentioned by Dr. Jenner, and to which I have already referred, see p. 15.

Is no other animal than the cow capable of perfecting this invaluable Prophylactic? What effect would take place by inoculating the dog, sheep, &c. with the matter of Grease, and also of the Vaccine? If the Vaccine is produced by the Grease originally, what would be the effect of Vaccinating a horse? Is he capable of keeping up the true infection in this manner as the cow; and what effect would the matter of Grease itself have on the horse by inoculation?||

It has been asserted that the Cow-pox had been discovered among the American cows to the northward. In the Medical Repository, Volume 5, p. 93, three Physicians, Doctors Buel, North, and Trowbridge, acquainted Dr. Miller with this fortunate occurrence about the same period; in consequence of which I addressed the following letter to those gentlemen.

“ DEAR SIR,

“ Will you excuse the trouble I am about to give you, in requesting an accurate account of the important discovery you have made, of the Vaccine amongst the American cows, as stated in the fifth volume of the Me-

|| See the extract of Dr. Jenner's letter to Dr. Waterhouse, p. 115.

dical Repository. I feel particularly interested in this inquiry, from having been the means of introducing it into Philadelphia; and having collected a considerable number of facts on this interesting disease, I am anxious to learn every particular of its origin amongst us.

"The particular points I wish to ascertain are, whether the disease has long been known; and whether it is supposed to originate in the animal itself, or by transmission from some other? Is the Grease or Scratches a common disorder among horses with you? Are men on large farms in the habit of milking the cows? And has the disease produced, always opposed the Small-pox?"

"An answer to these queries as early as convenient, will very much oblige,

"Sir, Your Humble Servant,

"JOHN REDMAN COXE.

"*Philadelphia, March 17, 1802.*"

To this I received the following valuable and interesting communications, for which I return the gentlemen my very sincere thanks.

"SIR,

"I cheerfully attempt to answer the request contained in your letter of the 17th of March last, relative to the Vaccine disease among the American cows, discovered in this place in June, 1801. No traces of the disease can be discovered here, previous to the time abovementioned. It undoubtedly originated in the animals from which the matter was communicated to the two women who milked them, and no other persons, either men or women ever milked those cows. The Grease or Scratches is not an uncommon disease among the horse kind here, especially in the winter season, but I cannot discover any case of it in that neighbourhood at that time, or for many months previous.

"Men are not generally in the habit of milking in our farms, and particularly in this family, where it is clearly ascertained that none but women had milked. In answer to

your last question, viz. 'has the disease produced, always opposed the Small-pox?' I will give a short account of its discovery and progress, and leave you to judge. In June last, my anxious researches were gratified, by discovering what I judged to be the genuine Kine-pox on the hands of two respectable women, a mother and her daughter in my neighbourhood. From those I inoculated about twenty, including my own family, in the months of July and August. People's prejudices were hard to overcome, and so few applied that I lost the matter, but soon found that the children were for mere pastime inoculating one another at school, without any guide, excepting a small caution which I received from Dr. Waterhouse, and published, viz. 'never to take matter for inoculation after the eighth day.' On the 9th of December last I inoculated Mr. Lemuel Taylor and ten children, in consequence of Mrs. Taylor having broke out that day with the Natural Small-pox. The whole of this family took the Small-pox from this first inoculation, excepting four of his eldest children, who had received the Vaccine disease about five or six weeks previous. This woman had the confluent pock to an alarming degree; the whole family attended her throughout (excepting the youngest, a sucking infant, which expired convulsed in the eruptive fever); the four abovementioned were inoculated with Variolous matter *seven* different times without the least effect, and yet remain so.

"A young man aged twenty, received the Vaccine disease in July, and a little girl aged five years, also received it in January; both have been thoroughly inoculated with Small-pox by a neighbouring Physician (an unbeliever) without effect. Those few experiments awakened the minds of the people to conviction, and as is *usual*, unlimited confidence succeeded extreme scepticism; the Vaccine inoculation pervaded every class of citizens so generally, that of three thousand three hundred inhabitants contained in the town, two thousand at least are judged to have received it: of those, fifty or sixty may be found who have from vari-

ous motives, repeatedly visited the different Small-pox hospitals, with indifference, yet no one has yet taken the disease. I shall be very happy to hear of its success, or any unfavourable appearances that may happen in Philadelphia, or elsewhere: At present my faith in the utility of this new disease is unimpaired, but should it prove fallacious, I think the public have a right to the earliest information.

“ With sentiments of respect,

“ I am your humble servant,

“ JOSEPH TROWBRIDGE.

“ *Danbury, April 7th, 1802.*”

“ *Sheffield, 15th April, 1802.*

“ DOCTOR JOHN REDMAN COXE,

“ SIR,

“ I delayed replying to your favour of the 17th ultimo, that I might communicate some facts in relation to the subject of domestic Kine-pox, which, at the time of my receiving your favour, wanted time to develop.

“ That the genuine Vaccine-pock has been derived from cows in one or more instances in my neighbourhood, is a fact, the truth of which I do not myself in the least doubt. The evidence on which my belief is founded I will attempt to detail to you in a brief and circumstantial manner. I was requested in the month of March, 1801, to visit a son of Colonel Joseph Goodrich, who I was informed was affected with sores or boils of peculiar appearance. I found him with several tumors upon his face and hands of the size of large boils, but *flat* upon the apex of each to the extent of a half dime piece, and having underneath, a small quantity of an almost colourless fluid. I was at once struck with the singularity of the appearance of these tumors. I had at that time a few patients under my care, whom I had caused to have the Kine-pox by inoculation; it occurred to me that the tumors resembled Kine-pox, but they were considerably larger and more prominent than

any I had seen in that disease. At my visit the next day, I strongly suspected the identity of his disease and Kine-pox, and that it was dissimilar to any thing else. I requested permission of the Colonel to inoculate some of his family with matter from the tumors, and others with Kine-pox matter, which I had in my possession, which was accordingly done. In two (which if my recollection serves me were all who received infection from the boy), the parts inoculated soon began to inflame, as in Kine-pox, and about the eighth day they had pyrexial symptoms. The progress was similar in one of those who received Kine-pox matter. The tumors were larger, the local inflammation more extensive, and the symptoms all more violent, in those inoculated from the boy than in the other person. One of those in particular had much local inflammation which continued several days, followed with the sloughing off of a sufficient quantity of substance to leave a pretty deep seated ulcer. The ulcer however, after digestion took place, healed kindly. I was now satisfied for myself that I had discovered the Vaccine-pock. It now remained that the manner in which the boy obtained it should be investigated. The Colonel I well knew kept a large number of cows: upon enquiry I found, that his son had been in the practice of milking them, and that it was recollected by the boy and others of the family, that one of the cows had been affected with sores upon her teats. It was also well remembered, that this boy a few days before the commencement of his disease, had in play with his companions, received several scratches upon his face and hands. Into these lacerations it is not improbable that matter from the cows (taken upon the hands, and they accidentally applied to the face) might have been insinuated, and in this way a complete inoculation come to be effected.

“ In about three weeks from the time when those whom I had inoculated in this family were diseased, I inserted into the arm of one of those who had been inoculated from the boy, and into that of the one who had had Kine-

pox otherwise, some good Variolous matter which had been taken the day before, from a person in Small-pox, but with no other effect *in either*, than a little inflammation of the part, which subsided in five or six days. This I thought pretty satisfactory evidence, that my domestic Vaccine disease was a preventive of Small-pox. I regret that experiments with this matter were not repeated while the matter which I had saved was active. But owing partly to a press of other avocations, and partly to the difficulty of obtaining subjects for experiment, the business was not prosecuted until the matter had lost its activity.

“Fourteen days since (which is the circumstance that caused my delay in replying to your queries), I inoculated the whole four of my abovementioned patients with Variolous matter without effect. The matter was unquestionably good, and the insertion faithfully performed. I shall not swell this epistle with comments, but attend to your query with regard to the origin of the disease in the cow. My own mind with regard to the origin of the disease in this case, as well as to the general principle, is in suspense. There is an air of improbability in the theory of the origin of the Vaccine disease from the heels of the horse, that I cannot get over. But to well authenticated facts I ought, as I hope I ever shall, yield conviction. Facts of this kind sufficient to establish the theory, I do not know that we are yet in possession of; circumstances in the case which I have related were not unfavorable to the truth of the theory. *The Colonel had a large number of horses, and some of them I was informed, were affected with the Grease in the heels; the same persons also who milked the cows dressed the heels of the horses.* The disease therefore might have originated in this way.

“I will just add that I have no doubt in my own mind, but that the Vaccine disease, was, in the course of the winter before last, derived from cows to the human species in two other families in this town. Several persons I believe had the true disease. But as the facts did not come

under my own observation, and as no experiments have been made on them with Variolous matter, I shall not swell this communication, already protracted beyond my expectation, with any particulars.

" There have been inoculated* by me, and under my inspection, in this town, about fifty patients, who have had the Vaccine disease in a mild manner, and about half of them have been tested with Variolous matter without effect in any instance.

" Should you wish Sir for any further information from me, in relation to this subject, I will ever cheerfully attend to your commands. If in the progress of your business in this line any new facts should occur, I will thank you to communicate them to me.

" I am Sir, respectfully,

" Your Humble Servant,

" WM. BUEL."

Dr. Waterhouse, to whom I wrote on the same subject, politely furnished me with the following reply. It commences the letter from which I have given an extract at p. 70.

" DEAR SIR,

" Your letter of the 17th instant came to my hands last evening. In answer to your query respecting the indigenous, or domestic origin of the Vaccine disease, I must inform you that I have my doubts. I had early information from Drs. Buel, Tröwbridge, and if I mistake not from Dr. North, on that subject. The matter sent me by the first never produced the disease, although the thread was as stiff as a wire with it: that was however no proof that it was not genuine. I have had information from perhaps a dozen quarters respecting this disorder among our cows; one was to me so un-equivocal, that I wrote to Dr. Jenner

* The necessity of employing the term Vaccination in contradistinction to Inoculation will I hope soon be generally admitted.

that we had certainly found it among the American kine; you will see however, in the London Medical and Physical Journal for September, that we were deceived. A young woman at Dorchester in the county of Norfolk, had an eruptive disease which she caught by milking a cow whose udder was covered with pustules; this person had a severe febrile affection, and painful pustules on her hands and arms; she was therefore sent into the Small-pox hospital and took the Small-pox from inoculation. I doubt not the accuracy, much less the veracity of these Practitioners, but suspect they have been deceived in a way similar to that I have related in the Medical Journal, under the communication respecting "*the effects of heat on the virus.*" Medical pupils and others have slyly inoculated cows, merely for the sake of the experiment, or for a supply of matter. I inoculated one of my cows for that purpose and succeeded to my wish. That the Cow-pox has arisen *spontaneously* (if a person may use that term who believes, that *strictly speaking*, there is no such thing in nature) in the kine of our country is a matter of which I am far from being entirely satisfied. I shall not therefore cease a rigid enquiry relative to the domestic origin of this distemper."

If the disease whose history is recorded by Dr. Trowbridge, was really the genuine Cow-pox, and of this there scarcely seems a doubt, how can we account for its production where there appears no vestige of the Grease? This must require the strictest attention to determine, as it will tend to prove the origin of the disease to be in the cow herself, or else that there has been some other source of communication from the horse. It is not impossible to suppose a cow to take this disease from the matter of the Grease, even though we cannot trace it to its source from the horse through the hands of a man who may have previously dressed the diseased heels. The matter of Grease or Scratches is a limpid fluid oozing from the cracks of the heels, and from thence consequently, must not unfrequently fall down upon, or be brushed off, by the herbage of the field in which the animal

may be feeding. Whilst still fluid upon the grass, we may easily imagine a cow might accidentally lay down in this very spot, so that her teats and udder should come in immediate contact with the infection, and thus by a species of inoculation produce the disease. There are many things of whose truth we are certain, which appear far more improbable. Some persons have supposed the disease could not originate from the horse, because it could not be traced completely in every instance, through the hands of men employed to milk. I think this mode of accounting for it may serve to reconcile these opponents.*

I hope these and the subsequent valuable communications will influence Practitioners to pay attention to the subject, in hopes of discovering the disease nearer at home. Dr. Jenner's idea that the virus, is as perfect in its *Equine* as in its *Vaccine* state at its first formation, is of the utmost importance, and will certainly meet with the attention it deserves, from every one disposed to forward his philanthropic views.

I shall here introduce the following important communication from Dr. Jenner to Dr. Waterhouse which he has very politely forwarded to me.

Cambridge, May 26th, 1802.

“DEAR SIR,

“I am induced to write to you at this time to give you a short extract of a letter from the worthy Jenner, which I received not long since, respecting a new source of the Vaccine virus, not knowing but what you would wish to insert it in your publication. It is this;

““I have sent you also some virus from a new stock. ‘The old stock now in use near three years, has not lost

* If the Grease does not give origin to the Vaccine; it certainly seems to depend upon some common cause, with this last disease; the same season and kind of weather disposing to both.

‘any of it’s original properties, nor do I suppose it ever will. A medical gentleman at Milan, Dr. Sacco, (who informs me he has inoculated 8,000 persons in that city), has lately sent me Vaccine virus taken from a dairy on the plains of Lombardy. It has produced again and again the perfect pustule here. I always ventured to predict that the Cow-pox was not confined to this island; but that wherever, in the same dairy, there should happen to be the peculiar intercourse I have pointed out between the horse, the man, the cow, and the milker, that there the disease may be called into existence. Abundant testimonies of the source of the Vaccine virus have lately appeared, and I have long been convinced that it is as perfect in all its extraordinary qualities in it’s *Equine* as in its *Vaccine* state; perfect on it’s first formation, and imperfect when secreted at a late period of the disease; just as it is, when transferred, and subjected to go through it’s progressive stages in the human body.’”

The following account of the discovery at Milan, in the words of Dr. Sacco himself, I shall be pardoned for introducing in this place. It is extracted from the Philosophical Magazine, No. 46, for March 1800 page 184.

“In our last we mentioned that L. Sacco, of Milan, had sent to Dr. Pearson, Cow-pox matter, taken from the Milanese cows. In a work published by Dr. Sacco, in Italian, entitled ‘Practical Observations on the Use of the Cow-pock, as a Preservative against the Small-pox,’ he gives the following account of the manner in which he procured the pus for inoculation, and also a representation of a cow’s udder infected with the malady.

“For some time I had been extremely desirous to repeat the experiments of Jenner, and for this purpose made diligent search to discover the Cow-pox in Lombardy, it being extremely difficult, especially in the present circumstances, to obtain the pus from England. A fortunate combination

of circumstances, by which it became necessary for me to go to the large town of Varese, in the beginning of autumn, procured me an opportunity of examining a number of cows on their way from Switzerland to the fair of Lugano; and by this means, I had a favorable opportunity to make such researches, as might discover in some one of them the Cow-pox. It was on this occasion, that, conversing with some dealers in cattle, and countrymen who had large dairies in Lower Lombardy, I learnt that the cows among us are subject to the Cow-pox. In this inquiry I took care to propose my questions in such a manner as to prevent the risk of being imposed upon. A farmer of Cremona, who had bought forty cows in Switzerland, and had driven them from thence as far as Varese, assured me, that almost all of them had been successively attacked with pustules on the extremity of their nipples, and some of these were now converted into incrustations. I visited the cows, and had an opportunity of verifying his assertions. I picked off some of these incrustations with an intention of applying them in fomentation, if, perchance, I could not procure the true pus for inoculation. The same farmer promised me an opportunity of seeing this disease with my own eyes, and for this purpose conducted me to a neighbouring meadow, in which we found a herd of cows belonging to a friend of his. We examined these cows, and discovered on two of them different red spots, which the farmer assured me was the first stage of the disease; no other symptom appeared on the cows, but a slight degree of dejection. He assured me that this was the very disease I was in quest of, and that, in the course of two days, the pustules would unfold themselves. At this visit which I made to the cows, there was present a dealer in the Grison's cows, who fully confirmed the truth of these assertions. He also added, that in his country, he had seen the cows afflicted with a similar eruption on their dugs, and to remove the incrustations, it was common to anoint them with boiled oil used for varnish; and that by

this means they fell off in the course of two or three days. Early next morning I went again to see the cows, examined them anew, and found on one of them four red spots, already tumid and raised into pustules; three of these were spread over the nipples, and the fourth lay in the middle of the dugs. The other cow had six pustules; two on the nipples and the rest scattered above them. These were larger than those of the first cow, and around them appeared a slight red circle. Apparently these pustules occasioned much pain to the cow, for, on my approaching to examine them more minutely, they would scarcely permit me to touch them for one moment. Although the pustules were already large and prominent, they did not yet appear to me sufficiently mature to yield the matter I wanted. As the cows were that day to go forward on their way to Milan, I found myself under the necessity of following them to their first halting-place, in order to examine them again next day. I walked out at an early hour to the meadow where they were at pasture, I examined the pustules, which appeared to me to be now arrived at maturity. They were lucid, and of a pale red colour, with a brown spot in the middle *more depressed*: and I thought this a favorable moment to collect the matter, which, through the assistance of the herdsmen, I was easily enabled to do by repeatedly soaking a thread in it. Although I saw no reason to doubt that this was the true Cow-pox, yet, this being the first time I had ever seen it, I began to suspect, that the pustules might be of that kind which Jenner calls the spurious Cow-pox. I determined, therefore to decide the matter by experiment. A considerable number of experiments, all uniform in their symptoms and progress, and always constant in their results, put the matter beyond doubt, and gave me full conviction that this was the true Cow-pox. Such and so many are the obstacles to be overcome on the introduction of any innovation, however salutary, that I for some time despaired of being able to induce any one to submit to inoculation with the

matter I had collected. In fine, after many fruitless persuasions, I succeeded in my design; the success which attended the first inoculations encouraged others to submit to the same process.

“Dr. Sacco then proceeds to detail three hundred cases, in which he applied the pus he had obtained in the manner described above. These cases were attended with various circumstances; but the inoculation succeeded to produce the Cow-pox in all of them; and in a considerable number the inoculation for the Small-pox was afterwards applied, but without any effect.”*

As connected in some degree with the progress of Vaccination in different parts of the world, I trust it will not be uninteresting to give a short history of its introduction into this metropolis.

Having perused with much satisfaction Dr. Jenner's treatise on the “*Variolæ Vaccinæ*,” together with some of the various periodical publications on the same subject about the close of 1800, I became very desirous of ascertaining the truth of so extraordinary a discovery. My desire was however checked by learning through the medium of the daily papers, that the Small-pox had been introduced into Marblehead, instead of the Vaccine, from which, (from my imperfect knowledge of the subject), I concluded the diseases were not easily discriminated. The history of this

* It may not be amiss to mention that the pock represented on the infected udder, very much resemble the pock on the hand in Dr. Jenner's first plate. They are not however coloured; and are apparently more depressed in the centre.

I wish we could generally fall upon some expression which might become general in the place of pustule. This is certainly an improper term, and the word pus, as used by Dr. Sacco and the English editor to imply the contents of such a vesicle, is yet more improper, for no such thing as pus is known in the Vaccine, except from accidental causes. The word *pock* will perhaps answer.

unfortunate event is minutely detailed by Doctor Waterhouse, in a communication dated February 1st. 1802, to the Editors of the New-York Medical Repository, and which has lately been published in the last Number of that valuable work, Volume V, page 373, &c. This circumstance (with the particulars of which I was unacquainted), together with the introduction of a spurious disease into New-York, Norfolk, and other places, persuaded me it was better to adhere to the old mode of Variolous inoculation, rather than depend on a disease I considered so very uncertain. For some months I thought no more about it; but finding by the publications from Europe, it was gaining ground, and that many who at first opposed it, were now become its strenuous advocates, I resumed my favourable opinion of it, and determined if possible to procure the infection. Through the politeness of Doctor Bradley and Mr. Ring, I obtained from London, several successive portions of infection about the end of September 1801. These failed in every instance. A subsequent portion however succeeded, which I received on the 13th or 14th of November. Previous to this, I had fortunately obtained an infected thread from President Jefferson, which he kindly procured for me from Doctor Gantt, in consequence of my request through Mr. John Vaughan. The infection was accompanied with the following highly satisfactory letter on the subject, which I have the President's permission to make public.

“ Washington, November 5, 1801.

“ DEAR SIR,

“ I received on the 24th ult. your favor of the 22d, but it is not till this day that I am enabled to comply with your request of forwarding some of the Vaccine matter for Dr. Coxe. On my arrival at Monticello in July, I received from Dr. Waterhouse of Cambridge, some Vaccine matter taken by himself, and some which he at the same time received from Dr. Jenner of London. Both of

them succeeded, and exhibited precisely the same aspect and affection. In the course of July and August, I inoculated about seventy or eighty of my own family; my sons in law about as many of theirs, and including our neighbours who wished to avail themselves of the opportunity, our whole experiment extended to about two hundred persons. One only case was attended with much fever and some delirium; and two or three with sore arms which required common dressings. All these were from accidents too palpable to be ascribed to the simple disease. About one in five or six had slight feverish dispositions, and more perhaps had a little head-ach, and all of them had swellings of the axillary glands, which in the case of adults disabled them from labour one, two, or three days. Two or three only had from two to half a dozen pustules on the inoculated arm, and no where else, and all the rest only the single pustule where the matter was inserted, something less than a coffee-bean, depressed in the middle, fuller at the edges, and well defined. As far as my observations went, the most premature cases presented a pellucid liquor the sixth day, which continued in that form the sixth, seventh, and eighth days, when it began to thicken, appear yellowish, and to be environed with inflammation. The most tardy cases offered matter on the eighth day, which continued thin and limpid the eighth, ninth, and tenth days. Perceiving therefore that the most premature as well as the tardiest cases embraced the eighth day, I made that the constant day for taking matter for inoculation, say, eight times twenty-four hours from the hour of its previous insertion. In this way it failed to infect in not more I think than three or four out of the two hundred cases. I have great confidence therefore that I preserved the matter genuine, and in that state brought it to Dr. Gantt of this place on my return, from whom I obtained the matter I now send you, taken yesterday, from a patient of the eighth day. He has observed this rule as well myself. In my neighbourhood we had no opportunity of obtaining Variolous matter, to try by that test the ge-

nuineness of our Vaccine matter; nor can any be had here, or Dr. Gantt would have tried it on some of those on whom the Vaccination has been performed. We are very anxious to try this experiment, for the satisfaction of those here, and also those in the neighbourhood of Monticello, from whom the matter having been transferred, the establishment of its genuineness here will satisfy them.* I am therefore induced to ask the favor of you to send me in exchange, some fresh Variolous matter, so carefully taken and done up, as that we may rely on it; you are sensible of the dangerous security which a trial with effete matter might induce. I should add that we never changed the regimen nor occupations of those inoculated; a smith at the anvil continued in his place without a moment's intermission, or indisposition. Generally it gives no more of disease than a blister as large as a coffee-bean produced by burning would occasion. Sucking children did not take the disease from the inoculated mother. These I think are the most material of the observations I made in the limited experiment of my own family. In Aikin's book which I have, you will find a great deal more. I pray you to accept assurances of my esteem and respect.

(Signed) "THOS. JEFFERSON.

"Mr. JOHN VAUGHAN."

This letter together with the Vaccine infection, was received by Mr. Vaughan on the 9th of November, 1801; A day which I trust will be memorable among the citizens of Philadelphia, from the great benefit connected with it. I immediately employed the infection which Mr. Vaughan put into my hands on myself and four others; although these last had never had the Small-pox, (which I had passed through in early life), my system nevertheless seemed more susceptible than their's, for I took the disease by the first attempt in two of three places, whilst I was necessitated to repeat

* In consequence of this request, I forwarded some recent Variolous matter, but am ignorant of the result of the trials made.

it in all the others. It has been said my disease was local; on this point I certainly feel myself competent to decide. I have in the Tables in the Appendix given the outlines of the case.* However this be, the matter from my arm proved a considerable source of infection, and either directly, or indirectly, has aided very extensively in propagating the disease. By the commencement of March I had supplied upwards of one hundred persons with Vaccine infection, with most of whom I believe it succeeded; amongst these are Practitioners of Physic in this and the adjoining states, and also in those to the southward; I have likewise forwarded it to the Natchez, to New Orleans, and to Martinique; whether it has proved successful in these places I know not.

Whilst I sincerely thank many gentlemen for their highly important communications, I have to apologise to others for my apparent neglect, in not supplying them with the infection which they have written for. It frequently happened that I received such applications when I had scarcely any of the infection,† and they must be sensible it would not have been right to have deprived myself of that small stock, by which I trusted I should have been able to extend the disease.

* It affords me pleasure to be able to say, that the disease on my arm, though advanced to the state of a scab, was at once recognised by an old English farmer, (from Suffolk, now residing near Chester), of the name of Ashford, to whom it appeared perfectly familiar, as well as at the less advanced period which is represented in Dr. Jenner's first plate. This man, though he has now resided several years in America, told me, he remembers the efficacy of the Cow-pock in resisting the Variolous contagion, but knew nothing of its having been effected through the medium of inoculation.

† I have already said, that many of my experiments were made with infection of various dates, in order to try the extent of time during which it retained its powers; hence it is no wonder I frequently failed; this, together with the various sources of failure I have formerly enumerated, will I doubt not, excuse me.

The advantages of Vaccination to the southern and several of the middle states, where Variolous inoculation is rarely permitted, are incalculable. The same may be said of Kentucky, where I am informed, there are nearly one hundred thousand persons who never have had the Small-pox.† The advantages of this disease are scarcely less considerable to some of the eastern states.

In the army and navy it doubtless deserves the attention of government, inasmuch as it seldom requires any confinement, or particular regimen; so little, I have already noticed, that in England the soldiers are not even entered on the sick-list in consequence of this disease. It is not long since I was asked for matter for the Constellation frigate, in which the Small-pox made its appearance after leaving the city. I had unfortunately at the time but little to spare; whether that which I sent took effect I know not. I was informed by her Commander Captain Murray, that in her last cruise, one hundred of his crew had the Small-pox, five or six of whom died. I need not say how great must have been the anxiety and inconvenience excited thereby, nor how much more serious such an occurrence might prove, should a vessel thus half unman'd, meet with an enemy. The simple knowledge of the fact will I trust, lead those in whose department this is placed, to attend to the subject.

I think it proper here to mention the great necessity of investigating every idle tale which is brought forward to depreciate the Vaccine. I have heard of a Practitioner of this city having a case with so bad an arm after Vaccination, as to make it expedient to amputate it; whereas this gentleman had not experienced the slightest inconvenience on this score. In another instance the Small-pox was said to have appeared *after Vaccination*. So far the story was true, but it was

† I regret I have it not in my power to give any account of a disease among the cows in some parts of Kentucky, which Dr. Brown informed me he had reason to believe was the genuine Cow-pox, and the particulars of which he promised to transmit. I have not yet received them.

not added that the child had *never taken the disease*, and was therefore inoculated to preserve it from the Small-pox which was in the neighbourhood. This was to be detected only by strict investigation! Such are the falsehoods which impede the progress of the brightest discovery which has ever been made! But the contest is in vain! Time has drawn aside the veil which obstructed our knowledge of this invaluable blessing; and in the examples of the Emperor of Constantinople,* of the Dowager Empress of Russia,§ and the King of Spain, we may date the downfall of further opposition.

I have thus brought to a conclusion the relation of the facts which have come under my notice, and have endeavoured faithfully to detail the result of my experience in the Vaccine from its first introduction to the present period. Most of the facts stated, I have myself observed, and have only to add, that I have never depended upon my memory, but have each day committed to paper every circumstance which appeared deserving of notice, of those cases which have come under my care. The infection when taken was always noted, both from whom I obtained it, and also the day of the month, and of the disease, so that I can trace to its origin almost every portion of matter, which I have either used myself, or sent to others. I hope this treatise, imperfect as it doubtless is, will still have the effect of aiding the extension of the most beneficial discovery which has ever been made, by tending to allay improper prejudice, and imprudent fears, both in Parents and in Physicians; and also of awakening the philosophical researches of the curious, in order to ascertain with due precision, what is the real origin of this wonderful Prophylactic.

* The favorite Sultana of the Emperor it is said, had her infant Vaccinated.

§ "The first child that was inoculated for the Cow-pox in Russia was named by the Empress Dowager, Vaccinoff, and a pension was settled on her."

Appendix,

CONTAINING

First—*Various Letters on the subject of the spurious cases of Vaccine which occurred in New-York, Norfolk, and elsewhere.*

Second—*A set of Tables and Notes comprising the outlines of some of the first cases of the Vaccine which came under my care.*

Third—*Sundry Remarks and Observations, &c. which have occurred to my notice since the publication was put into the hands of the Printer, and which I must have introduced here, or have altogether omitted.*

Extract of a letter to Doctor HOSACK, dated Philadelphia, the 10th of January, 1802.

“IT has been reported in this city, that you have had under your care, a child who took the Small-pox, after having passed through the Vaccine disease, and it has been urged by some as a cause for doubt of the efficacy of the latter in preventing the former. As this case militates so strongly against the present received opinions on this point in Europe, as well as against the experience I have had in several instances, I can scarcely doubt that the account has originated in some misrepresentation, and in consequence, most earnestly desire to have it from the fountain-head, as the only method of coming to the truth, &c.

“I am, Dear Sir,

“Your very obedient Servant,

“JOHN REDMAN COXE.”

To this I received the following Answer.

" New-York, January 15, 1802.

" DEAR SIR,

" IN reply to your polite letter of the 10th instant, I beg leave to assure you, that the report of a child having had the Kine-pox under my care, and afterwards taking the Small-pox, is incorrect, though not perhaps altogether without foundation.

" As it may not be uninteresting, I will relate to you the whole circumstances relative to the Vaccine inoculation, as far as I have hitherto had any concern it.

" Very early after the discovery of Doctor Jenner, my friend Doctor George Pearson, of London, sent me some of the Vaccine matter; but the thread imbued with it being only inclosed in a letter, I was not surprised to find it had lost its virulence: Immediately upon receiving it, I obtained permission from the inspectors of the state prison, to introduce it in that house, and inoculated two of the prisoners.

*" Although I was careful to introduce the thread below the skin, and afterwards to retain it in its situation by adhesive plaister, it did not in either case excite more inflammation than the thread uninfected, would have occasioned. Upon receiving a second thread from Doctor Pearson, and the testimonies in favour of Vaccine inoculation contained in his and Doctor Jenner's publications upon that subject, I did not hesitate to inoculate some of my private patients with it. I accordingly, with every possible precaution, inoculated six children with it; the result was the same as had occurred in those I had inoculated in the prison; very little inflammation was excited, not more than was produced by the wound and thread alone. Still confident of the advantages of Vaccine inoculation, and being informed that Doctor Jackson, of Boston, had lately arrived from England, and was supplied with the genuine matter, which he was at that time successfully employing at Boston, I applied to Mr. Quincey to procure me some of it from Doctor Jackson; he accordingly obtained it and carefully enclosed it in a phial, in such manner that it could undergo no change from the air: Without delay, I again inoculated six children with it; among others, a child of Mr. Charles Wilkes, Cashier of the bank of New-York; upon the third day, I examined the arms, and found them all *very much* inflamed, so much so, that I had no doubt of my success, with this third attempt; the inflammation continued, and extended about an inch around the part inoculated, and in each a pustule was formed, which filled with a watery matter, and did not heal in less than ten or twelve days from the time of inoculation.*

"Upon the eighth and ninth days, Mr. Wilkes's child had manifestly a degree of fever; in the other children there was no observable indisposition; there was no eruption upon the skin in either of them; but the inflammation of the arm was so great in all, that I had no doubt of the success of this inoculation; but to ascertain it, I afterwards inoculated them with the Variolous matter: to my great surprise, the arms inflamed, they all sickened, and each had a considerable number of pustules. The conclusion I drew from the above circumstances was, that the matter sent me by Doctor Pearson had totally lost its activity, from the open manner in which it had been conveyed, and the great length of time that necessarily elapsed before I received it; that the matter sent me by Doctor Jackson, was either not the genuine Vaccine matter, that it was not taken at a period of the disease in which it possesses the most active properties; or, that it had undergone those changes which Doctor Jenner has stated it to be subject to.

"My want of success has, however, not altered my faith upon this subject; the almost unanimous testimonies in its favour are not to be resisted; in our own country, we have abundant proof of its utility, &c. &c.

"I am, Dear Sir, with great regard,

"Your's, DAVID HOSACK.

"Dr. JOHN REDMAN COXE."

The following is an extract from my reply to the above, dated January 18th, 1802.

"Allow me to thank you for your satisfactory letter; I had accounted for the cases which came under your inspection, in the manner you have done, and am happy they have not damped your ardour. Permit me to ask the form and progress of the pustule, the colour of the scab, and whether you vaccinated with the matter of the pustules? How long after the disease was it before you inoculated for the Small-pox? Have you had any information from Doctor Jackson, relative to the matter he supplied you with?

"I hope you will pardon the trouble I give you, and believe me to be, Sir,

"Your's sincerely, J. R. COXE."

To which I received the following satisfactory reply:

"New-York, June 8th, 1802.

"DEAR SIR,

"YOU will think me remiss in not having replied to your favour of January the 18th; but I purposely postponed my reply to the questions it contains, until my observations

upon the Kine-pox have made me more familiarly acquainted with the characters which distinguish the *Genuine* from the *Spurious* kind.

"I am now perfectly satisfied that the pustules which were produced upon the arms of those children I inoculated with the matter I had received from Doctor Jackson, were very different from those of the *genuine* Cow-pox I have since employed, and am at present in the use of: In the former a *brown* scab appeared very early after inoculation, which does not take place in the *genuine* Cow-pox; the pustule had not in any stage of it that peculiar *pearl* colour, which characterises the *genuine* species; the matter discharged from it was less limpid, more approaching in its appearance and consistence to common pus; the pustule was not of so long duration, nor did it terminate in the black scab, as in the *genuine* disease. The failure of those cases inoculated with the spurious matter stated in my first account, I learn, with great regret, has given rise to a report in this city, which has prejudiced many families against the introduction of the Cow-pox; but this prejudice must in a short time yield to the numerous testimonies which we now possess, to shew that the *genuine* Cow-pox is a perfect security against the *Small-pox*.

"I am, Sir, with great regard,

"Your's, DAVID HOSACK.

"Dr. JOHN REDMAN COXE."

The following letter I received from Doctor Balfour, of Norfolk, in consequence of a request to obtain for me every possible information relative to the spurious disease excited there.

"Norfolk, March 25, 1802.

"To Doctor JOHN REDMAN COXE, Philadelphia.

"SIR,

"WHEN I last had the pleasure of seeing you in Philadelphia, you were so good as to furnish me with some of the freshest Vaccine fluid in your possession. I then promised to give you an account of the success I should meet with in propagating it in this place, and the history I could collect (for I did not then reside in Norfolk), of the spurious disease which existed here the last year, and at that time was called Cow-pox. That it was a spurious disease there is now no doubt; the event too truly proving—for unfortunately those who had this false infection, afterwards took the Small-pox, and some, it is said, fell victims to the deception.

"The impression made on the public mind, in consequence of this error, is a perfect horror at the name of Cow-pox: It has been further increased by the true Vaccine matter (with which several have since been inoculated), having failed to produce any

disease at all ; its infecting powers from keeping being lost. The females of this city are particularly opposed to the Vaccine inoculation ; so violent are they, that they generally declare they would rather their children should have the Small pox, and run their chance."

"I will now give you an account of the success of my practice : On the 7th of February, the day after I saw you, Doctor Currie of Philadelphia, kindly permitted me to take the fluid from the arm of a child under his care. It was on the 10th day, the areola just beginning, (I should have preferred it sooner). The same evening I left Philadelphia by water, and arrived here on the 17th following—I immediately inoculated a gentleman's child of this place, (Mr. Martin Fisks), and his negro woman : On the fourth day it was evident the infection had taken. In both cases the disorder progressed and declined in its most regular form ; by the 22d of March there remained nothing but a hard shining scab, when I inoculated them both with fresh Small-pox matter ; their arms were inflamed a little on the second day, but by the sixth were perfectly dried up, without producing the smallest affection of the system. Not perfectly satisfied with this assurance, knowing the public prejudice, I again inoculated both the child and negro woman with fresh Variolous matter from different persons. At the same time I inoculated with different Small-pox matter, a child of Mr. Lynch's, and a negro child of Mr. Beale's, both of whom had just got over the Vaccine disease ; but in every case the result was just the same, a small inflamed spot was visible on the second day and beginning of the third, but by the sixth was dried universally.

"Thus have we at length succeeded after so many unsuccessful trials, in introducing into this town the mild antidote to Small-pox. So many attempts had been made before, without success, that even medical men declared they did not believe the disease could be brought here.

"It will, no doubt, take some time to remove the obstinate prejudice of the public ; but like all great truths, it ultimately must prevail, and surmount every obstacle ignorance can oppose.

"Eighteen have had the disease in its mildest form, and numbers are now under inoculation. Not the least medicine has been required in either of the cases—not one has been kept for a moment from their labour or business—in no instance has there been an eruption of any kind ; their arms have not been sufficiently sore to require any attention, not nigh as much so, as in Small-pox. The fluid has universally been taken on the seventh, eighth or ninth days, never later, and always before the appearance of the areola.

"There is one circumstance I must remark ; I observed that the threads I have seen impregnated, have always been fine flaxen

thread, the matter, whether Vaccine or Variolous, forming a crust on the outside. A thread of this kind is generally extremely stiff, and on being handled is apt to crack and make the dry matter fly off; to avoid this, I have preferred a cotton thread of double or treble the size commonly used, and but slightly twisted: I am much mistaken, if to this apparently trifling circumstance, I am not in a great measure indebted for the facility with which I have communicated the disease; for with the cotton thread, I can as freely give the infection when the matter is a number of days old (by moistening it with a little warm water or steam) as with the fresh fluid from the arm.

"I have inoculated myself and another person, both of us had Small-pox in our infancy, decisively, having had fever, and a large number of pustules; but the result has been quite different from the experiments made in Europe by Doctor Pearson, for our systems were both considerably affected, (and in the same manner), indeed more so than any of those I have vaccinated, who have not had Small-pox. The appearance of our arms was, however, quite different from theirs; we were inoculated with fluid taken warm from the arm on the eighth day; on the fourth, there was considerable inflammation; on the same day the efflorescence, or areola, took place, extending three-fourths of an inch from the point of inoculation; no pustule was formed, as in those who had not had Small-pox; but a very small sore, depressed, and not a tenth part as big as in the regular infection; on the sixth day we both had considerable fever, puking, violent head-ache, and creeping chills over the whole body, particularly the back. Our appetite forsook us at the same time, and the glands of the axilla swelled and were painful: On the eighth day those symptoms abated, the inflammation of our arms gradually subsided, (sooner than in the regular disease) and on the thirteenth day, little remained but a scab (not much bigger than a large pin's head); and a peeling of the scarf-skin as far as the areola had extended: As I observed before, I have not had a single patient who had not had the Small-pox, who had the disease nearly as severe as we had.

"We have a third time inoculated for the Small-pox without effect: One person of seventy years of age has gone through the infection, and afterwards perfectly resisted Small-pox—forty odd are now under Vaccination.

"I am, with great respect,

"Your obedient servant,

"GEORGE BALFOUR."

On the 10th of January, 1802, I wrote to Doctor Taylor, of Norfolk, requesting him to give me every information, relative to the same subject. I had previously written to Doctor Barraud, of the same place. Those gentlemen did me the favour of replying, as follows:

“ Norfolk, April 15th, 1802.”

“ DEAR SIR,

“ WE feel ourselves obliged by your late communications on the subject of the Kine-pox, and for the trouble you have taken in possessing us with the Vaccine infection. Our acknowledgments would have been made more promptly, but that we wished to give you the fullest result of our labours; and although we have again to regret that this benign antidote to Variolous contagion has another unlucky incident thrown in its way by this late attempt to propagate it, yet we will relate to you the effects of our endeavours to introduce it in the last and present year.

“ In the first of the year 1801, some threads were sent hither by Doctor Spense, of Dumfries, with assurances that they contained the genuine Vaccine infection; coming in a direct way from Professor Waterhouse—We had for some time anxiously wished for the means of introducing the disease, and we seized the opportunity of immediately essaying it.

“ Parts of these threads were distributed to several gentlemen of our faculty in the town, and were severally used—Appearances were flattering in a high degree; an early inflammation followed the insertion of every thread almost without an exception; a pustule formed in the ordinary time, and the several characteristics of this inoffensive disease seemed to us complete. A sufficiency of infection was readily produced to proceed in our work—in several cases the arm was troublesomely sore, and in four instances under our immediate care there was fever that proved inconvenient for a day or two, attended with eruptions as abundant as generally are found in the milder Small-pox. About eighty persons had been subjects of this inoculation, when we procured some Variolous matter which for some weeks we had not been able to obtain: That we might defeat all the scruples of those who ever oppose innovations, we determined to test it with this infection.

“ The experiment was wholly unfortunate. Every person took the Small-pox, and went through it under all the ordinary circumstances.

“ Our disappointment was extreme—It was increased by our having circulated this infection among our distant medical brethren, with accounts of our own success and the progress we were making—Several of these gentlemen used it extensively, with disappointments similar to ours. Dr. G. of Williamsburg, had several patients as much distressed with the fever as is seen to be the case in inoculated Small-pox; two arms were sore enough to require the surgeon’s aid for some weeks.

“ Doctor Dick, of Alexandria, another of our correspondents, relates, that a person inoculated with some of this matter, after having gone through the disease, resisted the Small-pox with which he was several times inoculated, and that at the end of

some few months, he took it in the natural way, and had it severely.

“ Here then we seem to have unluckily received an anomalous disease, that late experience in Kine-pox shews us to follow an untimely regard in taking the fluid from the pustule

“ In the late winter we had some communications with Mr. Jefferson, who was made acquainted with our disappointment. He was obliging enough to send us a phial containing some infection that he recommended as fresh and genuine : At this very moment your own favours were received. With these authorities we were enabled to make fresh exertions to promote this work of humanity, this most estimable discovery of all the last century. To quiet all objections, we commenced with one of our own infants, and very soon after seventeen others submitted to the experiment.— Again we exposed ourselves to new mortifications ; our threads all proved ineffectual to our purpose, although we inserted them again and again. It follows that the delicate fluid, in these last cases, had suffered in travelling the short distance to us ; or that some unlucky incident occasioned its destruction. Yet the phial received from the President, came to our hands most carefully sealed, in a few days after the fluid was collected ; and the ingenious method of coating it with the gold-beater’s skin would seem to have defied all hazards. I mention these circumstances, merely to evidence the peculiar nicety that must be regarded in keeping or transporting this infection.

“ While we were determining these last trials, Doctor Balfour brought with him from Philadelphia, some infection that has proved good ; but for this, we should have intruded on you once more.

“ We have some patients now under inoculation with some of this last infection, and if we meet with any circumstance worthy your notice, we will make it known to you.

“ It is desirable that the friends of Medical science should watch over this new subject in the healing art, that they may entrench it from the accidents, and secure it against the factions to which it seems exposed from its novelty and its nature. Assuredly it calls forth the patrons of humanity, and the ingenious enquirer.

“ With respect we are,

“ Your obedient Servants,

“ JAMES TAYLOR,
“ P. BARRAUD.”

These important and interesting communications will, I trust, be a guard against future danger, by shewing the great attention which is necessary to become acquainted with the respective characters of the two diseases. I now proceed to the tables.

Case	SUBJECT. Name and Age.	VACCINE		INFECTION.		how in- troduced	Issue of the attempt.	GENERAL DISEASE.	
		whence obtain.	day taken	how old	Constitutional indisposition.			Eruption, and where.	
1	John R. Cox 5 attempts 6th	Mr. Ring, Lon- don. Mr. Jefferson	unknown 8th	unknown 5 days	13 punct. 3 threads	fails 2 successful	Head-ach, fever, drowsy, com- mencing on the fifth day, continu- ing three or four days.	None.	
2	J. Ricart 6 mo.	} Mr. Ring	unknown	unknown	7 punct.	fail	As all these cases failed in repeated attempts with the first infection I received from London, I had inoculated them for the Small-pox before I obtained a fresh supply.		
3	S. George 5 mo.								
4	E. Lige 3 mo.								
5	6 yrs.								
6	Betsy Ginn 6 yrs. 1st atpt. 2d 3d 4th 5th	Mr. Ring do. Mr. Jefferson Case 1 7	unknown do. 8th 8th 9th	unknown do. 5 days 2 1	3 punct. do. 3 threads 3 punct. 3 do.	fails do. succeeds fails succeeds	Scarcely perceptible.	A scratch of a cat upon the wrist, in consequence I suppose of the Vaccine matter coming in contact, produced a perfect pock.	
7	Andrew Bozier 28 yrs. 2d atpt.	Mr. Jefferson do.	8th 8th	5 days 8	3 threads 2 do.	fails succeeds			About the twelfth much indispo- sition, consequent to the too free use of his arm whilst the axillary glands were inflamed.
8	Richard Bozier 3 years. 2d 3d	Mr. Jefferson do. Mr. Ring, Lon- don.	8th do. unknown	5 days 8 10 weeks	3 threads 3 threads 2 punct.	fails succeeds succeeds	No indisposition till the scabs were rubbed off on the eleventh, when an ugly ill-conditioned ulcer, consi- derably deranged the constitution.	Five pustules, on the vaccinated parts alone; three or four fiery look- ing pimples on the eleventh day within the limits of the areola, they were gone by the fourteenth.	
9	Molly Bozier 1 yr. 1st atpt. 2d 3d 4th 5th 6th 7th 8th 9th	Mr. Jefferson do. Mr. Ring Case 1 8 unknown 26 13 32	8th do. unknown 9th 8th unknown 15th 10th 8th	5 days 8 10 weeks 1 day recent unknown 39 days 34 4	3 threads 3 do. 3 punct. 3 do. 1 incision. 2 punct. 1 do. 1 do. 1 do.	fails do. do. do. do. do. do. do. succeeds	None perceptible.	None.	
10	Maxwell	Case 1	8th	2	3 punct.	succeeds			Slight fever and head-ach for three or four days.
11	Sibella Peale 3 years.	Case 8 from the pock produ- ced by the 3d attempt.	9th	1	1 punct.	succeeds	Drooping ninth and tenth days, on the eleventh lively, on the thirteenth feverish and restless.	A considerable eruption of the Chicken-pox on the back, face, and extremities, amounting nearly to eighty in number.	
12	Lyttleton Ginn 29 years.	Case 8	8th	4	2 threads	succeeds	Chilliness, succeeded by fever, head-ach, and pa- nausea and vomit- ing, on the ninth, tenth, eleventh and twelfth days.	On the 12th day several minute pimples ap- peared around the pock. On the 15th day of the Vaccine, 16 days from exposure to the Natural Small-pox, and ten from Variolous inoculation, he had an eruption of the Small- pox about forty in number.	
13	Joseph Lee 30 yrs. 2d atpt.	unknown Mr. Jefferson	8th	22	2 punct. 1 thread	succeeds do.	Seventh day, feverish, chilly, head- ach, &c. continuing a few days; then subsiding, when a new set of symp- toms more violent attended, with nausea and vomiting about the ele- venth day.	On the 16th day an eruption of above thirty Variolous pustules, nine days from inoculation and eighteen from first exposure to the Variolous contagion.	
14	Geo. Patterson 25 years.	Case 8	8th	10	2 incision	succeeds	Ninth day considerable fever; nausea and vomiting on the 10th.	On the 10th day a Variolous erup- tion; being the 25th day from expo- sure to the contagion.	
15	Asa Warren 5 years.	Case 10	9th	2	1 punct.	succeeds	Head-ach, and drowsi- ness the 3d day, slight fe- ver on the 9th &c. from a limpid fluid, which dried away on the 3d, 4th, having the scab rubbed and 5th days. This child was almost con- off; also on the 27th 28th	On the 29th day the Chicken-pox in consi- derable number broke out, large, and filling with ver on the 9th &c. from a limpid fluid, which dried away on the 3d, 4th, having the scab rubbed and 5th days. This child was almost con- stantly exposed to the Variolous contagion du- ring the progress of the Vaccine.	

|| By incision is meant merely a long division of the cuticle, without the insertion of a thread.

Case	SUBJECT. Name and Age.	VACCINE INFECTION.				Issue of the attempt.	GENERAL DISEASE.	
		whence obtain.	day taken	how old	how in- troduced.		Constitutional indisposition.	Eruptions, and where.
16	Jas. Patterson 3 months.	Case 10	9th	2 days	1 punct.	succeeds	Fretful on the 9th from the pock being much rubbed. From the 13th to 15th feverish at night.	On the 16th day, 3 or 4 very distinct Varicellous pustules appeared on the face, which matured rapidly; both diseases were well by the 20th. In 7 weeks from Vaccination, an eruption of Chicken-pox.
17	Katy Smith 7 months. 2d	Case 13	9th	11	1 punct.	fails	Slight indisposition on the 10th.	None.
18	Leah Rogers 1 year. 2d 3d	Case 16 14 14, 15, 16, mixd.	7th 9th various	recent 1 various	1 punct. 1 do. 1 do.	fails do. succeeds	Restless and fretful the 8th day, probably from her teeth which came through about this time.	None.
19	Benj. Rush, jr. 10 years.	Case 15, 16.	various	various	1 punct.	succeeds	Very slight.	None.
20	Mrs. Morris	Case 11 (English stock)	11th	3 days	1 pun. in each arm	Succeeds; the arms were inflamed but not much evidence of pustules at the late period of the 8th day.	On the 6th day pain of the axillæ, restless and considerably feverish on the 7th, chilly on the 8th and 9th, with fever dull and heavy.	At about 12 days from Vaccination four pustules were discovered in different places; I could not ascertain by the account I received if they possessed the true Vaccine character. I rather imagine they were adventitious pimples.
21	H. C. Meade 6 weeks.	Case 15	9th	recent	1 punct.	succeeds	Drowsy on the 6th with slight starting occasionally at night.	A small pimple on one leg the 5th day, gone the next.
22	William Webb	Mr. Jefferson	8th	35 days	1 thread	succeeds	Eyes painful, feverish on the 10th continuing two or three days.	None.
23	Miss Forman	Case 10	9th	13	1 punct.	succeeds	Drowsy on the 6th, slight indisposition about the 11th day.	None.
24	Jacob Clarkson 20 years. 2d	Case 6 10	4th* 9th	17 20	1 punct. 1 punct.	both succeed	Considerable fever 9th to 12th, itching considerable.	None.
25	Jenny Boon, 1st 40 years.	C. 15 16 mix'd	8th or 9th	11	2 punct.	Creeping scabs considered as spurious.	Slight fever about the 11th day, on the 15th violent fever, tension and inflammation of the arm, ending in ulceration with aggravated symptoms.	None.
	2d	22	12th	1	1 punct.	Succeeds. About the 13th all 3 scabs rubbed off.		
26	John Talbot 2d	Case 23 25	10th 6th	6 recent	thread 1 punct.	fails succeeds	Drowsy with slight head-ach on the 7th and a fullness of the eyes on the 12th.	6 or 7 minute pimples near the pock about the 12th day, speedily retiring.
27	Wm. Chipley	Case 25	6th	1 day	1 punct.	A creeping scab considered as spurious	But slight indisposition, much itching.	
28	S. Ffirth 2d 3d	Case 25 25 29	6th 6th 9th	1 7 5	1 punct. 1 do. 1 do.	failed do. do.		
29	E. Jenner Cox 23 days.	Case 23	9th	14	1 punct.	succeeds	No indisposition apparent	None.

* This instead of the 4th. was in fact the 21st day from Vaccination. I have marked it as the 4th, as it was this period from its progressing, that the infection was taken.

Case	SUBJECT. Name and Age.	VACCINE INFECTION.			how in- troduced.	Issue of the attempt.	GENERAL DISEASE.	
		whence obtain.	day taken	how old.			Constitutional indisposition.	Eruptions, and where.
30	Titian Peale 2 yrs. 2d atpt.	Case 11	11th	34 days	1 punct.	Fails.		
	3d	do	do.	38	do.	do.		
	4th	29	8th	5	do.	do.		
	5th	23	11th	33	do.	do.		
	6th	32	8th	recent	do.	do.		
	7th	37	8th	recent	do.	do.		
	8th	9	7th	4 days	do.	do.		
	9th	22	12th	54	do. in	} do.		
	10th	25	6th	57	each arm			
	11th	41	7th	1	do.	do.		
	12th	44	8th	2	do.	do.		
	13th	75	7th	1	do.	do.		
	14th	76	9th	recent	do.	do.		
	15th	81	7th	recent	3 do.	do.		
	16th	Various		5 days	1 do.	do.		
	17th	Case 77	10th	7	2 do.	do.		
		77	10th	11				
		84	8th					
		Various		17	2 do. mix- ed.	do.		
31	M. Jones 10 months.	Case 25	7th	17	1 punct.	fails	This case was not vaccinated a second time in consequence of some doubts in the mother's mind.	
32	Bridget Kerlin 5 years.	From a case of Dr. Hewson's	18th, see case p. 27	2	1 punct.	succeeds	Slight indisposition, and ramb- ling on the 7th day.	None.
33	John Kerlin 3 years. 2d	Case 26	15th	8	1 punct.	fails	Fretful the ninth night.	None.
		do	do.	13	do.	succeeds		
34	Mary Kerlin 10 months. 2d	Case 26	15th	8	1 punct.	fails	Restless and feverish	On the 9th, 3 or 4 small pimples appeared on the arm above the Vaccine pock, which by the 13th had all but one disappeared; This shewed the genuine Vaccine character.
		do	do.	13	do.	succeeds	the 9th and 10th days.	
35	Nisa Rogers 35 years. 2d	Case 23	10th	32	1 punct.	fails	Much nausea and vomiting from the <i>spurious</i> disease, produced by the 2d attempt, attended with high fever, head-ach, pain of back, lassitude, great local itching from 4th to 6th day, with shooting pains and great axillary inflammation. The <i>spurious</i> disease by the 3d attempt was attended with great itching. Head-ach, fever, pain of the axilla, &c. from 5th to 8th day. In the <i>spurious</i> disease by the 5th attempt the symptoms were less violent. The 6th and <i>genuine</i> disease was very slight, although the part was much irritated.	
	3d	Mr. Jefferson	8th	82	thread	spurious		
	4th	Case 33	8th	1	1 punct.	do.		
	5th	43	7th	1	2 do.	fails		
	6th	obt. elsewhere	unknown	unknown	1 do.	spurious		
		Case 44	9th	recent.	1 do.	succeeds		None.
36	Pyrius 14 years. 2d	Case 22	12th	36 days	1 punct.	fails	But very slightly indisposed.	None.
		37	6th	recent	do.	spurious		
37	Robert 11 years.	Case 22	12th	36 days	1 punct.	succeeds	Fever 9th day, with nausea and vomiting, considerably indisposed to the 12th.	None.
38	John Heineken 2 years.	Case 32	8th	4	1 punct.	succeeds	Slight fever 10th day, with nau- sea and vomiting.	None.
39	Sally Dunn 7 months.	Case 37	6th	1	1 punct.	succeeds	Fretful the ninth night, slight fever the tenth.	None.
40	Betsy Dunn 4 years. 2d	Case 37	6th	4	1 punct.	fails	Feverish 10th and 11th; conside- rable fever with vomiting the 13th.	One little pock formed on the verge of the large one and ran into it.
		39	9th	recent	1 punct.	succeeds		
41	John Dunn 2 years. 2d	Case 37	6th	4 days	1 punct.	fails	Considerable fever on the 10th day: Violent symptoms at a later period from repeated irritations of the scab.	None.
	3d	39	10th	recent	1 punct.	do.		
	4th	40	9th	recent	1 punct.	do.		
		42	7th	15 days	1 punct.	succeeds*		

* With matter taken on the seventh day, I immediately Vaccinated a cow on the teats in two places; they however both failed, as did also a second trial by three punctures in a week afterwards, with matter of case 47 and case 49. The cow was nearly dry when I first attempted it, and it was soon discovered that she was some time gone with young: What influence this might have, I know not.

Case	SUBJECT. Name and Age.	VACCINE INFECTION.		how in- troduced.	Issue of the attempt.	GENERAL DISEASE.	
		whence obtain.	day taken			Constitutional indisposition.	Eruptions, and where.
42	Kitty Kerlin 7 years.	Case 34	12th	recent	1 punct.	succeeds	Restless the 8th, One pock on the inside of the right thigh, ap- scab complete the 12th, parently Vaccine. It had an areola, $\frac{1}{2}$ of an inch off the 18th. but was considerably rubbed before I saw it.
43	Marg. Barnhill 2 years.	Case 39	7th	recent	1 punct.	succeeds	Drowsy the 5th and 6th days, slight indispo- sition the 10th, probably from a violent cold. None.
44	Mne. Davidson 2 years. 2d at. 3d 4th 5th	Case 39 43 42 41 47	9th 9th 7th 7th 7th	recent 4 15 recent 3	1 punct. do. do. do. do.	fails do. do. do. succeeds	No indisposition. None.
45	James Wilson 17 yrs. 1st at. 2d 3d	Case 43 43 39 25 43	7th 9th 9th 6th 10th	5 7 13 58 8	1 punct. do. 1 do. in each arm, and also put on a sore from whence I rubbed a scab. 1 p. in ea. thread in each arm.	fails fails fails one succeeds fails	Went to the country as soon as infected. Never called again, I know not if it took effect.
46	— Wilkinson	Case 42	7th	15	1 punct.	fails	On the 8th day from the 2d attempt, during
47	Tom 24 yrs. do. 2d do. 3d do.	obtd. elsewhere Case 33 26 13 Mr. Jefferson elsewhere	unknown 9th 15th 8th 8th 7th	unknown 27 49 90 119 8	1 punct. 1 thread 1 incision 2 do. thread incision	fails succeeds fails do. succeeds fails	The small-pox broke out on the evening of the 11th day; which makes limpid fluid, a pain of the back and head, and the 16th from first expo- sure. It was very thick upon him.
48	Noah Molden 24 yrs. 2d at. 3d 4th 5th 6th 7th	elsewhere Mr. Jefferson Case 47 elsewhere Case 44 51 51	unknown 8th 8th 46 8th 9th	unknown 120 3 2 recent 5	2 punct. thread 1 punct. 1 do. 1 do. 1 do. 2 do.	fails do. do. do. do. do. do.	Did not take effect. See the Note.
49	Matilda Evans 5 months.	Case 41	7th	recent	1 punct.	succeeds	Indisposition On the 20th day several little pimples appeared on the scarce evident. face and neck which soon dried away.
50	Theodos. Pettit 2 mon. 2d	Case 43 44	4th & 5th 7th	24 recent	1 punct. do.	fails succeeds scab not off till 6 weeks	Slight indisposition on the 13th. An eruption of small red pim- ples on the hands and neck, on the 15th which soon subsided.
51	Thomas Burns 4 mon. 2d	Case 43 44	4th & 5th 7th	24 recent	1 punct. 1 do.	fails succeeds	Drowsy the 8th, slight indispo- On the 21st an eruption of small sition the 12th, scab rubbed consi- red pimples, continued a few days. derably.

From these tables it would appear, that of fifty-one cases, we must, to form an accurate statement, deduct cases 2, 3, 4, and 5, which were vaccinated (with infection I received from England) repeatedly, without any effect; hence I conclude its activity was totally destroyed: Cases 27, 28, 36, and perhaps 48, which had previously had the Small-pox, and hence were not altogether fair subjects. Cases 31, 46 (in one of whom it was not repeated a second time, and the other I know not the issue of), making in

NOTES referring to the preceding CASES.

CASE 1. In this case (my own), head ach, fever, and drowsiness, indicated a constitutional affection on the 5th day, towards the close of which an areola commenced its progress. Two out of three attempts succeeded, the areolæ of which uniting, formed one large one of an oval shape, and full six inches in its longest diameter.—On the sixth day the axillary glands were swelled and attended with considerable pain, especially on pressure.—On the seventh day of the disease I was called unexpectedly from town at 10 P. M. to see a person at twenty five miles distant. The night was dark and rainy, and at four in the morning the carriage was completely overset, by which I was compelled to stand in the mud and rain for half an hour before it was righted. Added to this, I experienced much anxiety and fatigue during the day, in my endeavours to reduce a strangulated hernia. I returned to town at four in the afternoon, which I did not reach till near midnight. During all this period I did not get any sleep, or but for a few minutes. I fully anticipated from all these circumstances, considerable augmentation to the symptoms of the Vaccine, but was agreeably disappointed in finding no increase of symptoms. It gave me great confidence in the disease, as it satisfied me of its mildness and perfect safety.

Since that period I have endeavoured to excite the disease in myself a second time, during a space of upwards of five months.

all, ten cases: Of the remaining forty-one, it will appear that

the first attempt it succeeded in	23,	or nearly	three-fifths
second do. in	10	do.	one-fourth
third do. in	2	do.	one-twentieth
fourth do. in	1	do.	one-fortieth
fifth do. in	2	do.	one-twentieth
sixth do. in	1	do.	one-fortieth
ninth do. in	1	do.	one-fortieth
seventeenth do. in	1	fails	one-fortieth

Of the twenty-three, who took it by the first attempt, the Virus was obtained

on the 4th day in	1	9th day in	7
6th do.	1	11th do.	1
7th do.	2	12th do.	2
8th do.	6	mixed, &c.	3

It also appears I have succeeded with matter taken on the eighteenth day before the areola was formed; with matter on the fifteenth day, taken at the recess of the areola; and on the twelfth taken at its height.

Of these cases I have inoculated about twenty, ineffectually, once, twice, thrice, and oftener, besides exposing several of them to the Small pox.

For the particulars of each case; the reader is referred to the Notes, the numbers annexed to which, refer to the same in the list of cases.

In *twenty two* successive attempts I failed, although in most instances I employed recent matter. In some few instances an intolerable itching, (commencing sometimes in three or four hours from inserting the infection), preceded and accompanied a little pimple which died away in two, three, and four days.

In a *twenty third* and *twenty fourth* attempt, with matter taken from a most perfect pock on the eighth day,* I at length succeeded in producing a *spurious* pock. About twelve hours after Vaccination the punctures were attended with an intolerable itching, and an inflamed circle was very conspicuous. By the third day a considerable pock had risen in both places, which by the fourth had rapidly increased, more especially in one (the other gradually declined), which now had a light but well defined areola around it of about three fourths of an inch diameter, with a hard base; the flat surface of the true disease was absent, yet something like depression of the centre was obvious. As it augmented, it assumed more of the Variolous character, the matter though limpid at first, putting on a purulent appearance in a short time. On the close of the seventh day a scab was forming, the itching, areola, and hard circumscribed base were nearly gone; and the scab came off about the twelfth day, without assuming so dark an aspect as that which forms in the genuine disease. A slight eschar still remains. No indisposition was evident.

Since this period I have renewed the attempt four or five times ineffectually.

It may not be amiss to remark that all my first attempts by above a dozen punctures with infection sent me from England, failed; as well as in cases 2. 3. 4. 5. 6.

From a perusal of the case above related, I think it must, (independently of the constitutional affection) be credited by most persons, that I really underwent the genuine disease; were this not the case, I cannot suppose I should have failed so uniformly in every succeeding attempt, as certainly, to a mere local affection, my system could not have been less susceptible than before.

CASE 2. Four days after my last attempt in this case, the patient broke out with the chicken pox. I have not since repeated it.

CASES 3. 4. 5. After the ineffectual attempts I made here with the matter sent me from England, as I had no immediate prospect of procuring more, I inoculated the patients.

CASE 6. The third attempt succeeded, as may be seen by the tables, but it did not advance till the eighteenth day six days

* With matter taken the preceding day from the same pock, I excited a genuine case of Vaccine, which was as perfect in its appearance and progress as any I have seen.

after I had succeeded in exciting the disease by other infection.

In this case the scabs were repeatedly rubbed off, but the sores heal kindly without any application. On the eighth day I inoculated her with recent Variolous matter, taken from her mother who was then labouring under a very full burden of the Natural Small pox, to which she had been exposed constantly for seven days. The three punctures I made, inflamed, and produced three small local pock, unaccompanied with fever or any eruption: they dried away by about the twelfth day.

CASE 7. Considerable inflammation and increase of fever followed the imprudent use of his arm, which swelled greatly, but yielded to a smart purgative and saturnine applications. On the fourteenth day I sent him to see the woman abovementioned (mother to the preceding case) and inoculated him on the seventeenth and twenty-second days, by two punctures each time, with recent Variolous infection. No effect but a slight inflammation for three or four days was produced. It was the first case I inoculated after passing through the Vaccine, and interested me very much.

CASE 8. This is the first sore arm I witnessed. The child was remarkably gross in his habit, and subject to a purulent discharge from the ears. The weather at the time was very variable with easterly winds. Being anxious to see the progress of the disease, I omitted both medicine and diet, which probably would have checked the violence of the disease. To this I must add, that I had produced three pock on the arm about one fourth of an inch apart, forming a triangle, with infection received from the President: I vaccinated the child three days after, in two other places, about an inch on each side of the above pock, (with matter just received from England), in consequence of my belief that the other had failed. Both attempts however succeeded, and *five* pock were the result. The three first were repeatedly rubbed off and at length formed one sore of considerable magnitude, and accompanied with great tension and inflammation of the arm and of the axillary glands. Citrine ointment checked the ulceration, and some active physic reduced the febrile symptoms; On the twentieth day I inoculated him with recent Variolous infection; The punctures inflamed two or three days when an attack of measles supervened, followed by dysenteric symptoms. The healing of the ulcer was checked considerably; and was not completely healed for two months. About ten weeks from the first attempt to vaccinate him I again inoculated him ineffectually.

CASE 9. This case I vaccinated as the tables shew, *eight times ineffectually*, by *seventeen different punctures* during a

space of two months and an half. The *ninth* attempt succeeded; an areola appeared on the eighth day. I inoculated her in two places ineffectually on the twenty first day. The matter which produced the disease in this case was taken from a patient in whom the disease was excited by infection of the eighteenth day. The infection of this case I forwarded to London, to try whether re-transplanting altered its efficacy.

CASE 10. This case was a student of medicine from Kentucky. He was inoculated on the eighteenth day with recent matter, which produced slight inflammation for a few days: about seven weeks after it was ineffectually repeated. He several times also exposed himself to the infection from others.

N. B. From his arm a fellow student in the same room who had had the Small pox, vaccinated himself, and produced two most perfect pock, accompanied with a constitutional affection unequivocally marked.

CASE 11. This case had no areola. On the thirteenth day the scab, which had been progressing, was suddenly suspended; early on the fourteenth an eruption of the Chicken pox, continuing to appear for three days, and drying on the fourth. During this period the Vaccine was completely stationary. On the fifth day the eruption was nearly dry, when immediately the Vaccine resumed its progress, and terminated favourably the twenty eighth day. Soon after this she had the Measles. Six months afterwards I inoculated her ineffectually by three punctures; a local irritation for a few days was the only effect produced.

CASE 12. This is the father of case 6, and was exposed to the Variolous contagion from his wife one whole day previous to Vaccination, as well as during its whole progress. On the sixth day I inoculated him with matter from his wife, as I feared the Vaccine might not be sufficiently advanced to secure the system. The Vaccine progressed, and in proper time the Small pox made its appearance, about forty in number, producing around the circular Vaccine a zone of confluent pustules, which gave it an angulated appearance in a short time.

CASE 13. This man had been exposed to the contagion of the Small pox two days before Vaccination. On the eighth day of the Vaccine I inoculated him. He broke out with the Small pox on the ninth day from inoculation, violent fever preceeding. About thirty pustules, which matured quickly. The Vaccine by irritation produced a sore, which healed kindly in a few days. In these as well as most of the blacks, the local inflammation was not to be distinguished except by a hard and tumid base.

CASES 14 & 16. The particulars of these cases are detailed at p. 76, *et seq.*

CASE 15. The disease was very mild. A month afterwards I was told he had the Small-pox. It proved however only a case of Chicken pox; his father who had had the Small pox long before, took the disease from him and broke out in two weeks with a precisely similar eruption, after a slight indisposition of two days; The eruption dried away in four or five days. From this case the subject of C. 16, also took the disease. See p. 78 to 79.

CASE 17. In this case the pock was rubbed off six or seven times successively; it did not however appear to have destroyed the Vaccine disposition; I am not positive, as I have never inoculated her.

CASE 18. The pock on this child's arm was rubbed off at least six times without any bad consequence. A month after Vaccination, I inoculated her, under a firm persuasion the Small pox would follow, as I supposed the Vaccine disposition was certainly destroyed. A half filled pustule alone was produced with moderate local inflammation; no eruption nor any fever but what I ascribed to some teeth (molares), which came through at this period with considerable difficulty.

CASE 19. This case had been twice inoculated when an infant, but it was doubtful if he had taken the disease. Much itching attended.

CASE 20. I have noticed this case, more in consequence of its having been mentioned by some as a proof of the violence of the Vaccine. This lady on the 3d day of Vaccination travelled down to Washington, which it is highly probable at that inclement season (December) might of itself induce a febrile indisposition, independently altogether of the Vaccine, which had scarcely on the 9th day enlarged itself to a pock. General Morris in a letter to me of January 11th, after mentioning the pustules, adds, "though she has been indisposed since, which I attribute entirely to a cold." Mrs. M. afterwards suffered from an attack of Measles; yet all her subsequent indisposition, was by many friends ascribed to the Vaccine.—This lady it will be seen by the tables, was vaccinated with matter which derived its source from the English stock I had received. The day after I had introduced the virus, I found the child from whom I obtained it had broken out with an eruption, which I satisfied myself was the Chicken-pox, but as it was the first eruptive case which came under my notice, it gave me some uneasiness.—These circumstances, which I stated to several, I afterwards heard mentioned in a way, that I could scarcely recognize the original account.

CASE 21. In this case no areola existed; she has however resisted the Variolous inoculation.

CASE 22. Areola about three inches diameter. On the 12th day when it was retiring, I obtained a considerable quantity of

matter. On the 19th day he visited a patient in the natural Small-pox and inoculated himself with the matter; since that time I have repeated it ineffectually; and he has frequently visited Variolous patients. A species of herpes existed on his arms, &c. which I hoped would have been removed; it was however not effected.

CASE 24. This man, I have understood, has, since he has crossed this "adamantine bridge," nursed several persons in the Small-pox.

CASE 25. The violence of this case I have noticed at p. 50, as also the abundant supply of infection it yielded at p. 31.

CASE 26. From this case I obtained matter nine days successively, from the 7th to the 15th. The areola had nearly gone when I took the last portion, on the 15th day, with which I excited the genuine disease in c. 33. 34. Before it began to scab (on the 16th day) it was I think full half an inch diameter. The scab did not fall off for five weeks. No sore arm was produced although the pock was punctured perhaps 50 times.

CASES 27, 28. The subjects of both these cases were studying medicine: both had had the Small-pox when young. The first had a small tumour of a spurious nature, produced, attended with considerable itching and axillary inflammation. In the last, a slight inflammation appeared for a few days. I believe he has since ineffectually repeated the attempt several times.

CASE 29. The scab came off the 21st day; when I inoculated him with recent matter by one puncture. I repeated it on the 31st day by two punctures, and in seven weeks from this time by three punctures without any other effect than slight local inflammation for three or four days. The matter was fluid from persons labouring under the Natural Small-pox. In four weeks from this last attempt, I sent him to see c. 47 on the 8th day of an ample eruption, of Small-pox. This man held the child one quarter of an hour in his arms; but as may be expected without effect.

CASE 30. This child had just recovered from the Chicken-pox, taken from his sister c. 11. On the third day after the third attempt, he burnt his arm near the Vaccinated part. Is it probable any effect was produced by the different irritation of the burn, or by the constant application of lead-water? At this period he became restless, eyes watery, &c. which continued the 4th, 5th and 6th days, when the Measles made their appearance; they soon disappeared: The speck at the Vaccinated part continued to afford hopes it would succeed. It soon however came to nothing. Between the 11th and 12th attempt, a period of nine weeks elapsed, when I vaccinated his infant sister of four weeks. She took the infection without difficulty by the first attempt, and

had it in the highest degree favourably. With recent infection from her arm I again repeated it on him without effect, and five days afterwards I tried ineffectually to produce it by first rubbing the arm well, and then scraping off the cuticle with the shoulder of my lancet, making also several slight punctures, over which I deposited a large portion of infection. Variolous infection after a few days of local irritation dried away, as did likewise a mixture of Variolous and Vaccine infection——What can be the reason of so constant an opposition to the Vaccine infection? The system doubtless would be equally uniform in opposing the Small-pox.

CASE 31. Some doubts arising in the mother's mind, I did not repeat the attempt.

CASE 32. The scab came off the twenty-ninth day : On the thirtieth, I inoculated her with recent matter by two punctures. They inflamed a day or two and disappeared.

CASE 33. The pock in this case augmented in size, *after* the subsidence of the areola, to nearly an half inch diameter. The scab did not appear till the fifteenth day ; on the twenty-sixth I inoculated her with recent matter, which inflamed a day or two and disappeared. This and the next case were produced with infection of the fifteenth day.

CASE 34. In this case the scab was repeatedly rubbed off, but eventually healed kindly. The pimple remaining had every evidence of the Vaccine pock, the circular form, depressed centre and flattened surface, with a beautiful areola of half an inch extent. With the matter I vaccinated her sister. c. 42.

CASE 35. This is a curious case ; of six attempts two proved abortive and three produced a spurious disease, with a creeping scab or incrustation, containing a purulent fluid. The constitutional symptoms ran very high in these spurious products, and the local irritation and pain was excessive, whereas the genuine disease was very mild.

CASE 36. This boy is supposed to have had the Small-pox. The pock never assumed the character of the Vaccine. It was accompanied with great itching and ran its course very quick : On the nineteenth day I inoculated him with no effect.

CASE 37. The symptoms in this case, seem to have run higher than usual. They arose however, I believe, from irritation produced by too free a use of the arm : The pock was very large. On the twenty-fourth day he was ineffectually inoculated in three places.

CASE 38. This child was teething at the time of Vaccination, he also had a cough, and a complaint of his bowels arising probably

from the teeth ; and probably giving rise to the slight indisposition on the ninth day. On the eleventh the areola commenced, continuing to the fourteenth or fifteenth. The pock increased after the subsidence of the areola till the seventeenth day, when it was, I think, nearly an half inch in diameter. The scab now began to form, and soon perfected itself. Although this pock had a most flattering appearance, I repeatedly punctured it without obtaining any matter, once alone I procured an inconceivably small quantity. After the areola had subsided, I did not attempt to obtain it, though I might probably have then got a considerable portion.

CASE 39. The areola in this case was the most perfectly circular I have seen ; it came on the tenth day. The matter I obtained on the seventh day, I forwarded to England. About six weeks after I inoculated it ineffectually with recent matter ; a slight inflammation for a few days only occurring.

CASE 40. This child had the scab rubbed off repeatedly, and received several knocks upon it, which produced great irritation and the consequent symptoms. By the end of six weeks it was nearly well.

CASE 41. This child was a fat gross habit, much troubled with worms and very fretful at the time of Vaccination. I gave no orders as to diet or physic, which doubtless tended to increase the symptoms. The pock was repeatedly rubbed off, and much irritation produced. The weather also was raw and wind at east ; the child was always in the streets, till at length the symptoms increased greatly, with extreme pain and inflammation of the axillary glands. It was difficult to induce physic to be taken, but it was astonishing how rapid a change for the better took place after the operation of an active purgative. Poultices were required to allay the inflammation, and the citrine ointment followed with advantage. It took up eight weeks.

CASE 42. I have said in the tables that this case was vaccinated with infection of the twelfth day. It was in fact only of the fourth day, as it was taken from a secondary pock. The areola here commenced the seventh day and was nearly gone by the ninth. On the fifteenth day I inoculated her in three places with matter taken the preceding day from a person labouring under the natural disease. A slight inflammation for a few days was all the effect produced.

CASE 43. In this case I obtained matter on the *ninety-third* hour from Vaccination, or less than four days ; I might probably have obtained it sooner. I procured it six successive days, by repeated punctures, yet without producing a sore arm, or in the least injuring the pock. She had a bad cold previously to, and during Vaccination.

CASE 44. A short time after the first attempt, she was attacked with cynanche trachealis, which she recovered from in two or three days; after passing through the Vaccine she was inoculated with recent matter, which appeared to inflame for a few days, and then disappeared. She has also been exposed to the natural contagion ineffectually.

CASE 45. This young man was sent to Philadelphia for Vaccination, in order to insure obtaining the infection, by Doctor Chapman of Bucks county, to whom I had ineffectually forwarded matter. The disease after repeated attempts, was excited by infection fifty-eight days old. From him I understand the disease has been extensively communicated.

CASE 46. I understood this gentleman, he had had the spurious disease at Norfolk, or some place to which it had been sent from thence. I know not if my attempt succeeded, as he did not favour me with a second visit.

CASE 47. The original matter which I received from Mr. Jefferson appeared to take effect here, but as the Vaccination was performed only five days previously to the eruption of the Small-pox, the pock which was apparently rising with great regularity, soon assumed the angulated irregular form of that disease from the confluence of the pustules. I have no doubt but for this circumstance, a true Vaccine pock would have advanced to maturity, from matter then nearly four months old. This man had been exposed to the Variolous contagion from a fellow-servant, five days before the first Vaccination. It will be seen that one of the first attempts likewise succeeded with infection twenty-seven days old, but which advanced so slowly that I had renewed the attempt, under the idea of its having failed. I obtained infection from this pock before the Variolous eruption.

CASE 48. At the time of my last trial, he told me that in autumn last he had an eruption, which was supposed to be the Chicken-pox, accompanied with fever, head-ach and pain of the back; it was not violent, though a considerable crop attended—a few pits were left. Whether this might have been a light attack of Small-pox I know not: I however omitted any further attempt, intending to try again at a future period.

CASE 49. On the fifth day a circular inflammation was extending around the pock, and by night had increased to nearly an inch in diameter; by the morning of the sixth it had entirely gone. On the ninth day the true areola commenced its course, terminating on the twelfth day. She has withstood the Variolous infection by inoculation.

CASE 50. On the nineteenth day I inoculated this child with recent infection ineffectually. On the fifteenth day an eruption

of small pimples appeared on the head, extending to the face and neck, which in three or four days subsided.

CASE 51. On the twenty-first day an eruption resembling that in the preceding case. In about ten weeks an eruption of small pimples attended with great itching; it much resembled urticaria, coming out successively on the face, arms and body. It soon disappeared, and in a week or ten days was succeeded by a larger eruption, more resembling Chicken-pox, which also took place in the nurse.

Remarks, Observations, &c.

THE following highly interesting case, whilst it proves the possibility of passing through the Vaccine after having had the Small-pox, proves likewise, that the infection can be occasionally absorbed, even without any previous injury to the cuticle. In fact this must be frequently the case among the cows in its communication from the hands of milkers; and why should not the same occur in the human species?

On Saturday the 8th of May, Dr. Sermon vaccinated the daughter of Mr. E. of five months old, on the *right* arm above the elbow, which not appearing to have succeeded, was repeated in a few days in the other arm. This last attempt altogether failed; but about eight days from the *first* trial, a pock commenced its progress, going through its various stages with great regularity, and at the present period (June 7th) a perfect scab exists upon the part.

Mrs. E. was accustomed to lay the child constantly upon her *left* arm, so, as that the Vaccine pock on the right arm of the child was in contact with Mrs. E.'s left arm above the elbow. No abrasion or scratch of the cuticle existed, nor can the minutest trace of such having been the case, be discovered. On Saturday 29th of May (or about two weeks from the commencement of the Vaccine pock in the child) a pimple was evidently progressing, with considerable itching. As this itching had been perceived, but not attended to, for two or three days previously, we may safely state this day as the third from the absorption of the infection. On Sunday (the fourth day if my conjecture is right) she felt considerably indisposed with heaviness of the limbs, fever, pain of head and back; pain and swelling of the axillary glands, which still continue slightly, all indicating a constitutional indisposition.

On Wednesday (seventh day) an areola commenced, and was at its height as large as a dollar on the eighth and ninth days, after which it gradually declined. This day, (Monday June 7th, the twelfth of the disease) a scab is commencing in the centre. The pock is depressed in the centre, is perfectly circular, with edges raised and flat surface; some limpid matter is still evident, part of which I employed for Vaccination, but it failed of taking effect.

This lady was inoculated twenty years ago by the late Dr. Glentworth, and had at least two hundred pustules in her face alone, as her mother informed me. Her imagination could scarcely have induced a belief of the symptoms, if they had not actually existed.

THE following case which has resisted the action of Variolous infection, I introduce from its extraordinary rapidity:

On the 26th and 31st of May, I vaccinated Lewis Calansalingo, a black child of six years of age, a Dispensary patient, with infection of thirty-two, and of three days old, ineffectually. At the same time I also vaccinated his sister of four months with the same matter. In this case the last attempt succeeded and progressed finely. On the eighth day, I vaccinated her brother with fluid matter from the arm. This took effect, and on the sixth day I obtained matter from it. It was a perfect pock in every respect. On the 14th June (the *eighth* day) a perfectly hard dark coloured scab was completely formed; no indisposition attended, and no hardness had existed around the base of the tumor; so that I am satisfied there was no areola. On the *eleventh* day the scab was quite black, when I inoculated him by three punctures, which produced a slight inflammation for three or four days, and then dried away. The scab came off about the 14th or 15th day.

THE following outlines of a case which occurred to Dr. Otto, I introduce, to shew the Vaccine is not to be regarded as a perfect preservative against Small-pox, if the system has been exposed to the contagion before the Vaccine has exerted its full effect.

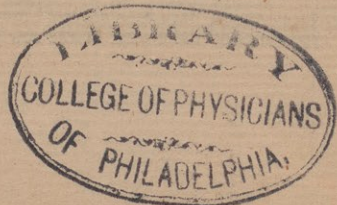
On the 30th January, Miss P. was attacked with fever, &c. which continued the two following days, when an eruption of the Small-pox took place, between two and three hundred of which filled. Her sister, who never had had the disease, was constantly exposed to the contagion till the 3d of February, when she was Vaccinated. The symptoms of constitutional disease occurred

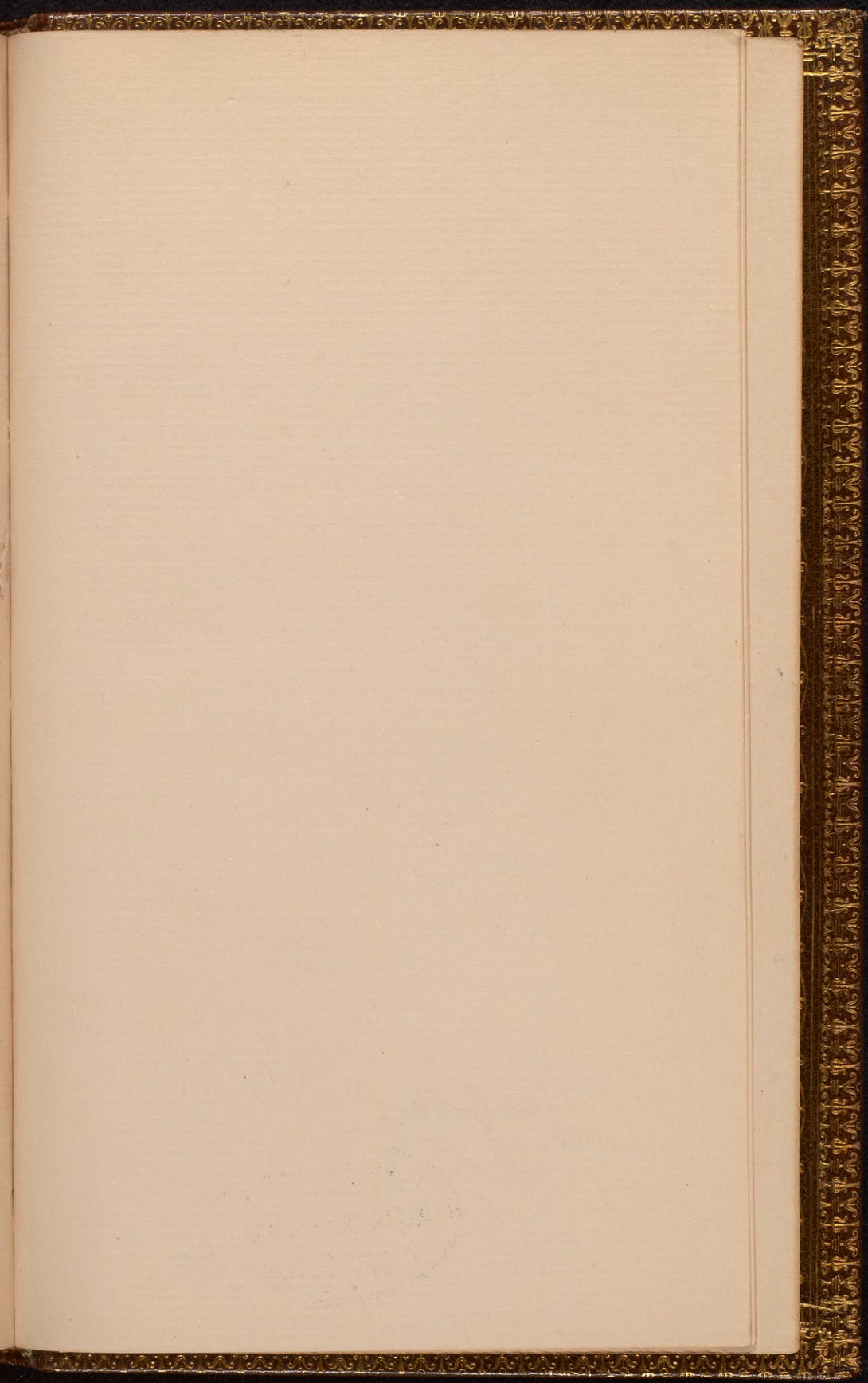
"inhabitants, have never had the Small-pox. What obligations
 "do we not owe to Doctor Jenner, for the discovery of so safe
 "and easy a mode of escaping the ravages of that horrid dis-
 "temper."

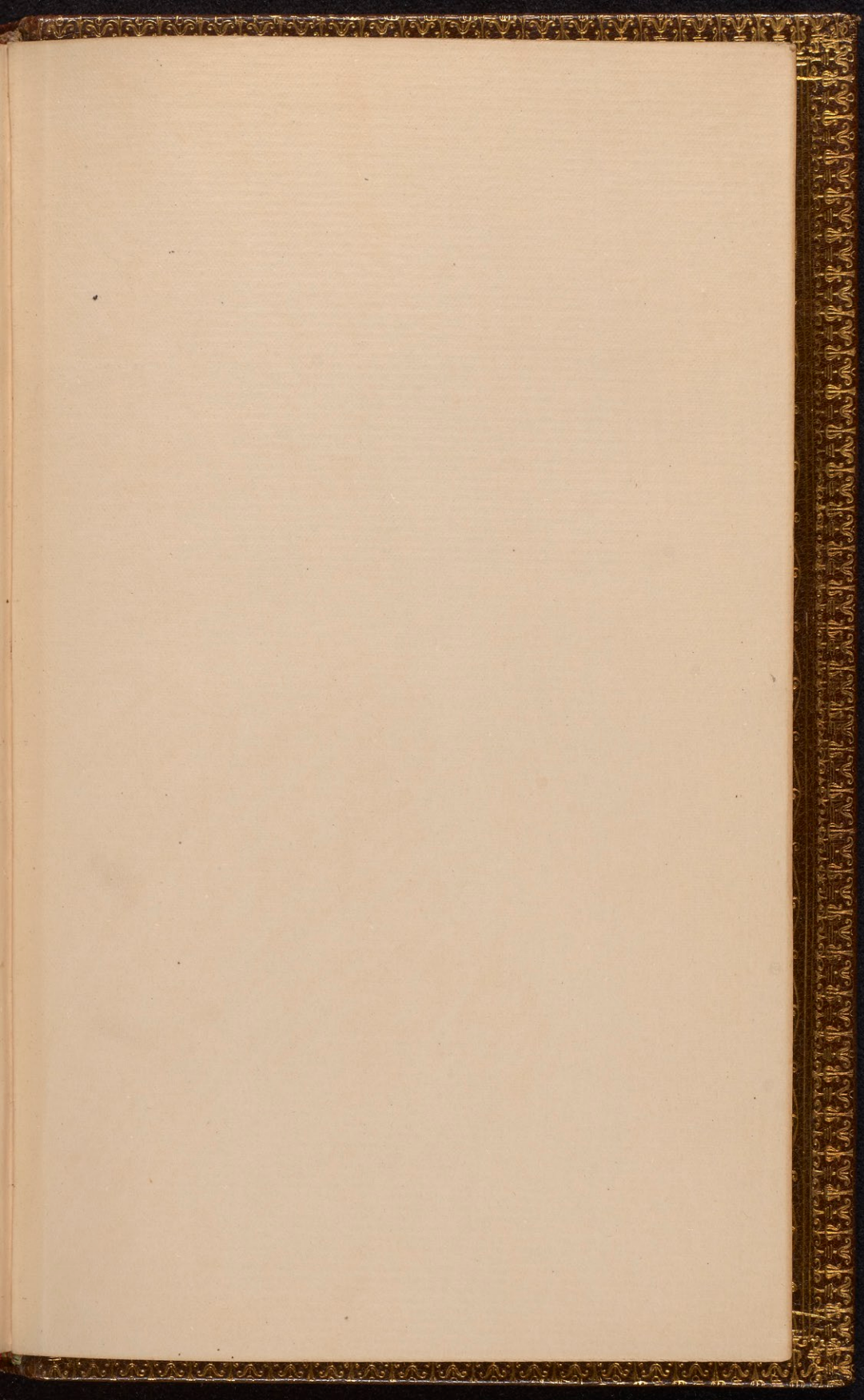
By a letter from Mr. William Dunbar, dated "Natches, 30th
 May, 1802," to Mr. John Vaughan, we have the pleasing in-
 formation of the certain introduction of the Vaccine into that place.
 The prelude I hope of the final extinction of Small-pox in that
 part of America.

I SHALL here conclude with a short remark on the still exist-
 ing prejudices of many against inoculation generally, under a
 false impression that, as all diseases are in the hands of the AL-
 MIGHTY, it is a species of impiety to tempt him, by thus usurp-
 ing his prerogative in producing a disease, which probably
 might have been escaped! But should not all who argue thus, to
 act consistently, refuse medical assistance in every instance? Does
 not accepting a dose of physic from the hands of a Physician, argue
 the same impiety, inasmuch, as without such aid, health may be
 restored by the blessing of PROVIDENCE? But the fact is, the
 error consists in blindly refusing to employ the means which are
 placed in our power, to remove the evils to which we are expo-
 sed.—That same bounteous CREATOR who has provided us with
 food necessary to our existence, has likewise supplied those medi-
 cines which are administered to our relief in a state of disease;
 and has given reason to man, to enable him to distinguish what
 may benefit, from what may injure him. Inoculation then should
 be viewed as a medicine, disagreeable in itself, yet administered
 to escape a greater evil.—In the same light ought we to view,
 and to prefer, this new species of inoculation; as it possesses every
 advantage, exempt from the disadvantages, of that dreadful dis-
 ease the Small-pox.

FINIS.



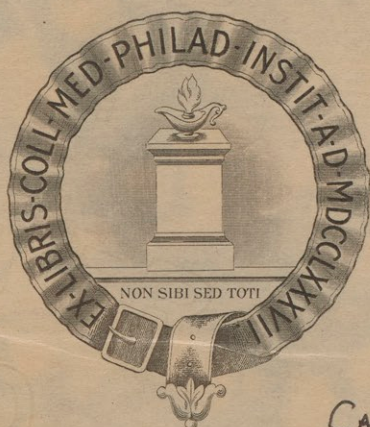






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